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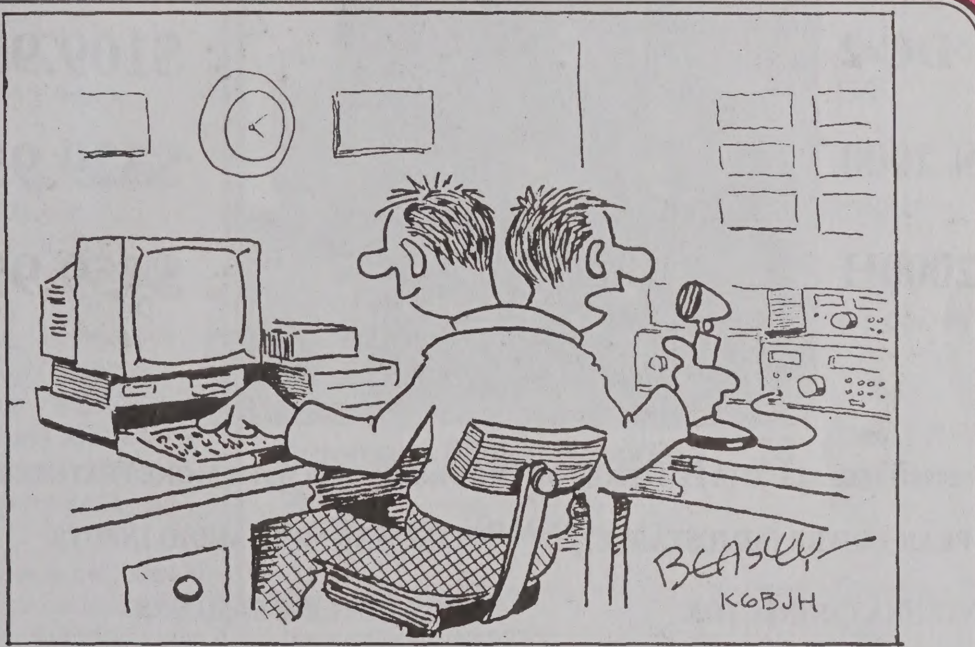

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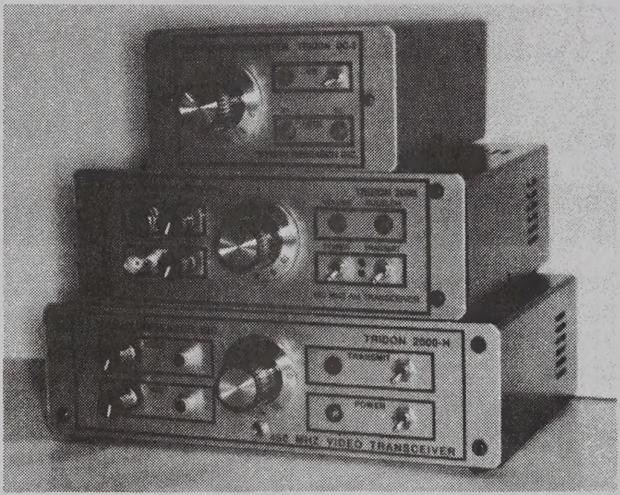

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CyberHam Magazine
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Editor's Soapbox For This issue

Sharon Harlan - WB9SFT

Dayton Hamvention 1997 is almost here. As I said in the last issue, Harlan technologies will be in Booth 212. We hope to meet you there. You will also be able to meet some of our writers. Gene will be very busy, so if you miss meeting him in the booth you can catch up with him at the SSTV Informal Forum on Friday night at 7:00 PM at the Ramada Inn N. He will be speaking on using the Sound Blaster boards for various applications. On Saturday Gene will be at the SSTV forum, 12:00-2:15 PM speaking on what is available to operate SSTV. Later on Saturday afternoon 4:00-4:30 PM he will speak on "Is the Internet killing Ham radio?" Bill Pasternak. WA6ITF will take the yes point of view and Gene will take no. This should be a good discussion.

We always say we want to hear from you, either good or bad. When we do, we will try our best to change and improve what you don't like. One caller recently stated that he thought the magazine was too technical, and to remember that there are beginners out there. We will try, in future issues to have more beginning articles on various subjects such as how to get into Packet Radio. We do want to be able to appeal to all of our readers so that you do not feel as though you are getting nothing out of the magazine.

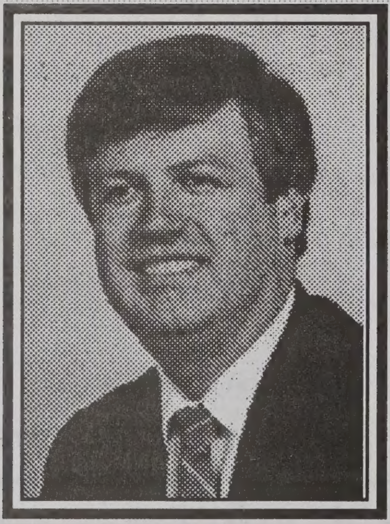
In this issue we have six new advertisers and I want to welcome them, and thank them for placing an ad with us. To you the readers please support these companies that are purchasing ad space from us. Tell them you saw their ad in CyberHam Magazine.

73,

Shari

Make Mine Margarita's

Gene Harlan - WB9MMM



I am very happy to see all the new advertisers this month! Welcome, and I hope you will get calls and sales so you will continue to support CyberHam Magazine. Make sure that when you do call one of the advertisers, that you say that you saw it in CyberHam magazine. This is the ONLY WAY they will know that placing an ad here is worthwhile.

Our CyberWriters love to get mail (email) so they can tell how they are doing. Make sure that you let them know if they are writing about what YOU are interested in. If you prefer, you can let Shari & I know and we will forward the message, as we have done in several cases already.

We need a better way of letting everyone know about how good CyberHam Magazine is. I had one request the other day from a ham that was going to a radio club meeting that dealt mainly in digital communications. He requested that I send some free samples for him to take to the meeting and show the other hams. As long as we have a supply, we will be happy to do so. Just let us know who to send to, how many, the club name, and date of the next meeting. We need to get the word out that we have a good product, and it seems that many subscriptions come from those that have bought it at the local ham radio store, or have been shown a copy by a friend!

Harlan Technologies is proud to announce a new product, SPECTRUM FFT. This is an audio spectrum analyzer that is pretty nifty. It was written by Henk Thomassen, PE1AHY, and will be distributed by us. The screen layout is very attractive and has many features which make it easy to use and be able to show the signal that you want to see. It will work with the Sound Blaster 16 or AWE32. Check out page 24 for more information.

See you in Dayton!

73 - Gene

Linux Labyrinth

Gene Melton - AK9N

In the last installment of the Labyrinth, some progress had been made in printing files and other documents. At least that was the way it seemed at the time, since the next time I turned on the Linux machine to continue with this project, printing was broke again. I can't say what had happened to cause printing not to work. Without going into a lot of gory detail, I spent some time fiddling again with file permissions and ownerships. Nothing was accomplished during that session other than frustrating yours truly, so the PC was put to bed, since I needed to go to work the next morning.

It was now time to take a step back, look at where the problem(s) could possibly be, and stay away from the 'shotgun' approach. I used to work with people who would like to twiddle with all the adjustments, knobs, and settings on a piece of equipment that had quit working. By the time we had found the original problem, it was time to do a re-alignment before the equipment could be restored to service.

Since a file to be printed was placed into a spool directory, to be printed from there by lpd, why not put a file into the spool directory? That should work ... Well, it didn't work, but for reasons I will get to later. So I backed up yet another step and the following command

```
cat "filename" > /dev/lp1          (entered as root)
```

caused "filename" to be printed. At least the printer still worked and was connected to the PC. When I surf the newsgroups (Linux, ham radio, engineering, etc.) and find something that looks perhaps useful for later, it usually gets dumped to the printer. Digging through this collection from one of the Linux groups, I found some information about a small and straightforward printcap file.

```
lp|Clarence:lp=/dev/lp1:sd=usr/spool/lp1:sh
```

My system had the /usr/spool/lp1 directory, the above line was also embedded in /etc/printcap.original, so I revised my printcap (which was based on the Printing How-to document) to be the above line. Success again! The command

```
lpr "filename"
```

caused "filename" to be printed, although the staircase effect was still there. This time around, setting the printer to do a carriage return after each line feed took care of that problem for now. Some where in the future I'll come back and play with input filters again.

Speaking of playing with stuff, somewhere in the same vein as 'if it's not broke, don't try to fix it.' After getting printing going again and while working with pr, I tinkered with lpc, which is the line printer control program. Yup, I managed to break printing again. One of the commands in lpc is abort, which kills the spooling daemon right now! Needless to say, it took some time to find the original problem and do a re-alignment. See the paragraph above about the shotgun approach.

During this troubleshooting stage, I discovered that lpr didn't directly drop the file to be printed into the spool directory. Rather lpr drops two files there, but with off the wall file names. Try cfAa14000094 or such on for size. It must make sense to lpd. One of these files is the one to be printed, the other is made up of lines that contain such things as the job name, machine host name, login name of user who invoked lpr, name of file being printed, etc.

Pr is a program that converts text files for printing. Entering the command

```
pr "filename" | lpr
```

causes pr to do it's thing with "filename" and then dump the output to the printer via lpr. Some of the things that pr can do:

- -columns
- -double space
- -user specified header on printed output
- -user specified page length and margin
- -user specified page width

along with some other options. I could not get the columns feature to work correctly. It printed that portion of the file that would appear in the left hand or right hand column of a regularly printed page. With pr it's also possible to print two different files, each in it's own column. You can specify your own header to be printed at the top of each page rather than the filename as default. So instead of printcap, "Printcap file that finally worked correctly" can be put into the page header. I used the command

```
pr "filename" | less
```

to dump pr's output through less to the screen to be able to check out it's features and capabilities rather than chewing up a tree. I found myself wondering if it could print from page 3 to page 5 with proper coaching. It will begin printing from a specified page to the end of the document, but there are times when I only want certain pages.

Before leaving printing, using lpr causes the printing to be done in the background, giving the PC back to the user to continue on with other jobs. Just stay away from lpc unless absolutely necessary!

As I have been tinkering with stuff lately, one of the problems that keeps popping up is a full hard drive. 120 Megabytes doesn't go as far as it used to anymore. A recent purchase at one of the local computer shows was a 1.6 Gigabyte drive that should be going into the Linux PC in the next few weeks. This also seems like a good opportunity to upgrade Linux. I have the Infomagic 5-CD set which includes Red Hat, Debian, and Slackware along with megs and megs of other miscellaneous things. Since I've had relative success (?) with Slackware, I'll probably install their version 3.0.

I received a new product announcement the other day from Personal Database Applications, who are the people behind LOGic logging software. Their new product is SARtek-1, a Universal Antenna Rotator Controller, which looks to be an interesting station accessory. It's a half length PC expansion card that interfaces to your existing rotor control (work with a soldering iron is required for all but a Yaesu SDX), and the rotor can then be controlled via software; the LOGic logging program, a Windows 95 program included with SARtek, or user written software. There have been times during contests or when stumbling over that rare DX, that it would have been convenient to tell the rotor where to point the antenna and then go back to concentrate on the radio. The list price is $170.00 plus $5.00 shipping to U.S. and Canada. Their telephone is (770) 307-1511, Web URL **www.hosenose.com/~pda/sartek**.

Enough for now, I hope to see you (or am glad to have seen you) at the Cyberham booth at Dayton.

73 - AK9N

Gene Melton - AK9N - Gene makes his living in the electrical utility industry as an EE (Univ. of Wis.) in the area of substation standards and design. He has been a ham for almost 20 years, and enjoys chasing those elusive DX stations on the low end of 20 and 80 meters. Gene's email address is : **emelton@interaccess.com**

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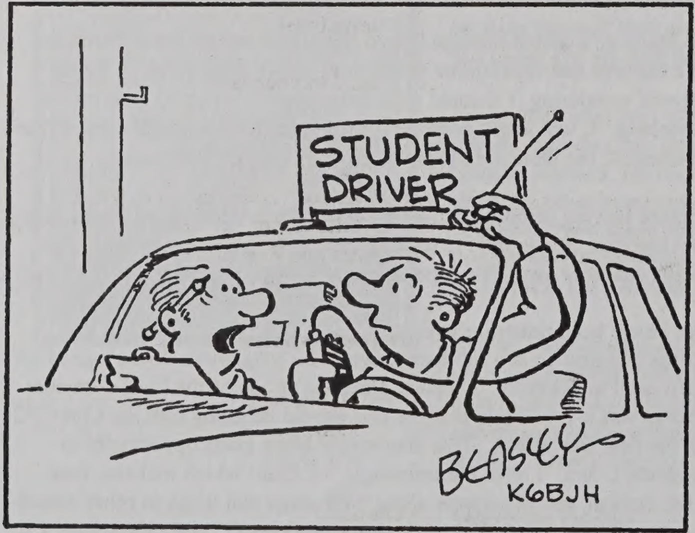

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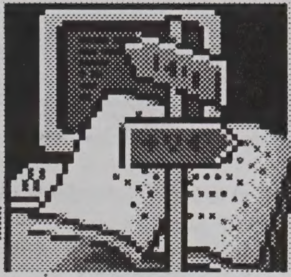
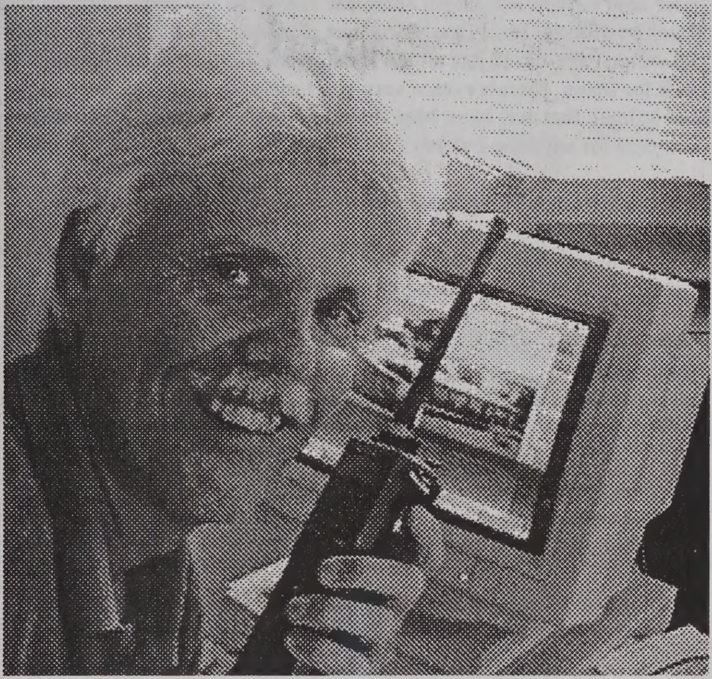
Ham Radio and the Internet

Don Brown - KQ4YM





Let's take another internet cruise. Here are some hints and places to go on the internet, the web, and it's vast ocean of information.

I'll comment on some new sites discovered this month. I have placed links to all of the mentioned web sites or programs to download on my web pages on Southwest Florida Online. You can go directly to all of the web locations in this article and past articles by going to:

http://members.aol.com/browne/cyberham.html

There you will find links to each web site or program to download as mentioned in any Cyberham article I've written.

So let's get aboard...

AOL has new versions of it's browser out now. The AOL browser is a version of Microsoft's Internet Explorer and earlier versions were more or less stripped down and didn't have all the features of the regular Microsoft version. The latest versions are now catching up and now include midi-music playing automatically, while earlier versions may not have. The AOL browser, when used on Macintosh computers did not seem to have this flaw. Now all versions seem to be playing music without problem.

It is always a good idea to keep watching for the latest versions of the browsers available. It's sometimes a lot of trouble to download these large programs and then get them installed, but when a much improved version comes along, I'd go for it. In the past, I 've found that the beta versions are not always crucial to try to get. They have numerous bugs still in them and you may spend a lot of time dealing with them, so I don't usually bother to download the beta versions.

The only exception to that rule is when there is no other version. For example, AOL didn't have a new version for Macs except for their beta, so I had no choice.

I've still found, by the way, that my Netscape browser seems to be faster on the Mac than the Internet Explorer browser. I'll like to hear from others who may have found a difference in speeds between the two.

Len Winkler has a radio program weekly on WWCR called "Ham Radio and More" on Sunday evenings that most always is informative and interesting. You can check out Len's web page and even hear his shows on the internet.

He will be at the Dayton Hamfest and is presenting a Ham Radio Open Town Meeting on May 17th at 3 p.m. The program will be produced by Bill Pasternak of Newsline. The web page is at:

http://www.goodnet.com/~lenwink/hrm.htm

They'll be discussing contesting, the internet, and the ARRL. Should be interesting. So take a look at his web site for more information.

And speaking about the Dayton Hamfest, the Tucson Amateur Packet Radio webpage has a section about the hamfest as well as links to most anything about ham radio. It's always a good place to look for updated info. TAPR also has RealAudio links for online audio. It's at:

http://www.tapr.org/

And if you'd like to go directly to RealAudio broadcasts of ham radio news broadcast programs go to TAPR's site at:

http://www.tapr.org/tapr/html/news.html

You can then listen in the background to your favorite show while searching the internet.

Another radio broadcast program of interest to hams and shortwave listeners is Glenn Hauser's World of Radio. The broadcast is heard numerous times during the week. Talks about radio subjects and broadcast shortwave stations. His schedules and RealAudio programs can be found at:

http://hudson.idt.net/~khecht19/radio/shortwave/ghauser/

Lou Williams has a nice site if you're planning to upgrade your license and looking for the FCC exam questions. He has them for all the tests and even a sample test to see how you do.

http://www.acs.ncsu.edu/HamRadio/

And while you're traveling cross-country to the hamfests, take a look at the Artsci Publishing repeater directory online. Lists of all states in an easy-to-use functional format.

http://www.artscipub.com/repmain.html

Want to learn about the MARS program? The Navy/Marine Corps MARS page is a good introduction to the service that relays messages from ships at sea to families at home.

http://206.202.0.2/~navymars/index.html

An interesting Amateur Radio Reference site is at:

http://www.panix.com/clay/ham/

It's set up like a reference book with a search engine. The site's clean format lets you look at categories of ham subjects and get to them easily. It is incomplete in that many categories, have only listings of a few of the available links possible. But still it is worth looking at this handy site.

For some very interesting recordings to listen to online try McGreevey's Very Low Frequency radio ".wav" files.

http://www-pw.physics.uiowa.edu/mcgreevy/

You can load these files online or save them for off-line playing. Some are pretty large files so check the size before you attempt to download them.

And now one of the most complete "ham magazines" online. Called appropriately "Ham Radio Online," it includes a lot of stories, news items and very interesting stuff. Probably a good place to look at least monthly to keep up to date on the latest news and products in ham radio.There's a very good article on the future of ham radio. It's at:

http://www.hamradio-online.com/

And now for you Macintosh computer fans. I've had some requests for resources for the Mac. One of the best places to check is the Macintosh Resource Page which has all the latest news, product intros and update info for Macs. There's even a very good search spot to look for a product or topic that may have been discussed in earlier articles. Excellent resource for any Mac owner or user.

http://www.macresource.pair.com/

I hope you enjoyed this month's voyage and learned something new or useful. There's a lot of territory out there to explore.

Don Brown, KQ4YM is a Florida ham and also writes for the amateur radio magazine Florida Skip and edits the web site Southwest Florida Online. Send your comments, and your internet tips and favorite sites to me by e-mail to: **KQ4YM@ix.netcom.com**

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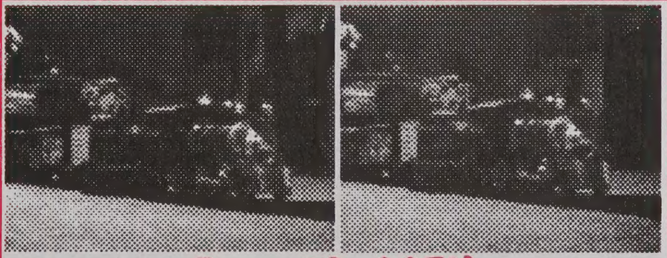

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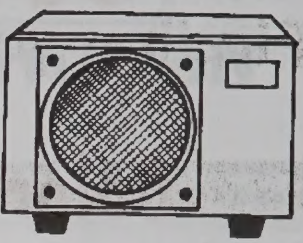
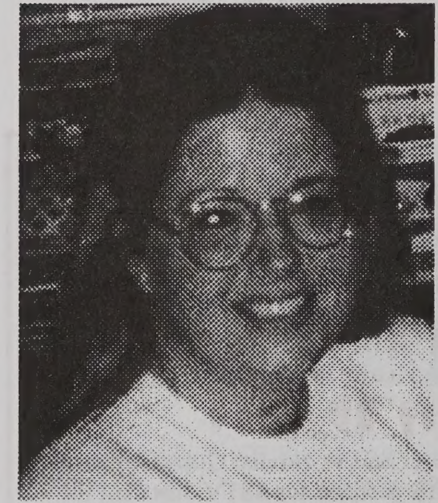


As Hams, we know the magic of being able to hear the invisible radio signals that are all around us. We can pull in signals from all over the globe on the our radios; however, if you have a natural curiosity about the things going on in YOUR world, UHF/VHF scanning should interest you.

Jeff Goldman WA1UDB is the SysOp of the CompuServe HamNet Scanning Section. Jeff explained to me that scanning allows you to be informed about the many events happening right in your own neighborhood. You don't even have to wait and read it in the newspaper — you can hear it as it happens, via your scanner!

The airwaves are free and you don't have to spend a fortune to get started. The older crystal scanners are inexpensive, but are obsolete. They limit you to the frequencies for which you can find crystals, which invites boredom. Plus, services change frequencies, rendering your old crystals useless. The new synthesized radios are more versatile. A base monitoring station is nice, but a handheld style can be taken anywhere.



You can get started for around a hundred dollars but as with a computer, if you become serious about it, you soon may outgrow it. Jeff's advice is to get something in the $200 range that you won't outgrow, but will grow into. Scanning doesn't involve investing additional money. There are no monthly satellite, cellular or cable fees.

Instead of having the TV droning on in the background, a scanner can provide an entertaining alternative. Get a good frequency directory book and program your scanner for the frequencies that interest you. It might take a little effort, but it's worth it. Some scanners have an automated search/store function! Among the transmissions you can easily monitor in addition to the fire, police, ambulance and weather are the aviation and train frequencies. The air shows are particularly fun to listen to. Railfans will enjoy hearing the conductors talk with the depots as they travel through the area. Listening to the marine frequencies will make you wish you were out on a boat! Auto racing fans; bring your scanner with you to the races and you can share the excitement of the drivers communicating with their pit crew.

Business frequencies can be fun to monitor also. Some buffs enjoy listening to fast food drive-thru's. Listening to the taxi dispatch frequencies are more entertaining than the old TV show Taxi! Jeff expends a lot of time and energy researching the latest and greatest in scanning equipment and related hardware/software, constantly updating the HamNet Scanning Section. He gets tips from Wayne Wilson, the Communications Buyer for Tandy Corporation — we get the scoop first on HamNet!

Hardware is frequently discussed in the forum. The popular on-going threads are now discussing the new Bearcat/Radio Shack Trunk Tracker Scanner, the Radio Shack Pro 64 scanner and the OptoElectronics Scout. The Scout is a pocket frequency counter. Anytime there is a transmission, it picks up the frequency and stores it. If there is a nearby walkie-talkie in use, this little gadget will tune certain scanners and you'll immediately hear the audio.

The Scanning Library in HamNet contains lists of scanning frequencies used in the USA and the world, computer/radio interface programs as well as information on different types of scanners. One exciting program available for downloading is a decoder program called MDT1.zip. It displays text transmitted to Public Service Mobile Display Terminals on your computer screen.

Scanning can open a whole new world to you, as well as being a stepping stone for those listeners who wish to get a ham ticket. Stop by the Scanning forum and meet others who share your new found interest. Tell Jeff (75162,2371) I sent 'ya

If you are the Dayton HamVention in May, stop by and say hello to me; I'd love to meet you! I'll be at the FISTS CW Club booth #C-14, as well as speaking at a forum with the Publisher of CyberHam Gene Harlan on Saturday afternoon at 2pm in Room 5 in Hara Arena. If I don't meet you at Dayton, I hope to C U on HamNet!

Nancy WZ8C

Nancy Kott - WZ8C - Nancy was first licensed as a Novice KB8FAY in 1988 with the intention of just using 2 meters to keep in touch with her parents (WK8F/WO8E) who live about 50 miles away. But she got bitten by the CW Bug and a couple years later upgraded to Extra WZ8C. Nancy is very involved with the International Morse Preservation Society, aka FISTS and has been a SysOp on the HamNet forum about 3 years. Snail mail address is Nancy Kott PO Box 47, Hadley MI 48440-0047 Her email address is **nancy@tir.com** or **73631.3654@compuserve.com**.

ibits
Finding your way.....

Ken Farver - KB9I

The boss (Gene) thought an article about DirecPC (satellite internet connection) would make a good topic, so I called them up and they said to get all I needed off of their web site at HYPERLINK "http://www.direcpc.com" **http://www.direcpc.com** so here it is!

DirecPC Fact Sheet
Everything You need to know about DirecPC
What you need:
PC With Pentium Processor
Windows '95
16 MB of RAM
20 MB of free hard disk space
A Modem (9,600 baud or better)
A clear line of sight to the South

DirecPC Personal Edition Contents:
21" Elliptical Satellite Dish
100' of coaxial cable
16-Bit ISA Card
Software
DirecPC Installation and User Manuals

Do You Have What It Takes To Run DirecPC?
DirecPC beams satellite technology directly to your home or office machine. Before you sign up, be sure your building offers a clear line of sight to the South and can accommodate a 21-inch satellite dish. You'll also need a Pentium PC and an Internet service provider. If you're prepared to go beyond modems and ISDN, up to 400 kbps, then you're ready for DirecPC. Complete the checklist to learn instantly whether you've got what it takes.

DirecPC is for the serious Internet user. Before you sign up for DirecPC, you need the following:

Unobstructed line of site to the South from your home or office
PC with a Pentium processor
Microsoft Windows '95
16 MB of RAM (minimum) and 20 MB of hard disk space
Modem (9,600 or better)
An Internet Service Provider (monthly cost not included in service price)
No tolerance for waiting

Currently, DirecPC does not support the following operating systems:
Macintosh, Windows 3.1 or lower, DOS, UNIX
If you use one of these or any other operating system and wish to receive updates on DirecPC releases, please send us a description of your configuration and will let you know about any planned updates as soon as they become available.

Installing DirecPC

Do It Yourself: No help required - $0.
Basic: Ground mount plus 50 feet of coaxial cable - $99.
Standard: Roof or Wall mount plus 100 feet of coaxial cable - $149.
Premium: Roof or Wall mount and ISA card plus 100 feet of coaxial cable - $199.
Custom: Special installation to fit any requirement - $89 per hour plus materials (may be required for chimney mounts, aesthetic reasons, zoning regulations, etc.)

Some residential and historical areas have restrictions on external structures attached to your home. If you need more information, please contact us. For more information on installing DirecPC, call 1-800-886-4947 and an Installation Specialist will help you choose the installation best for your home. After installation is requested, a certified installer will usually come to your house within 48 hours. Geographical restrictions may affect price and service time.

It's easy to install the DirecPC satellite dish and ISA card. The DirecPC Personal Edition User Manual provides you with all the information you need. If you prefer, however, DirecPC also offers installation options for any situation.

Do-It-Yourself:
Everything you need to know is in the manual. You just follow these simple steps:
Call up a friend who owes you a favor, crack open the manual and begin.
Send your friend up on the roof to mount the dish.
You stay at the computer installing the adapter card and software.
Your friend keeps moving the dish until the computer indicates that the dish is pointed South at the correct angle. You're ready for DirecPC.
Go to your favorite Web site (www.direcpc.com, no doubt).
Call your friend to share your excitement. No answer.
Call the fire department to get your friend down off the roof.
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Service & Pricing

DirecPC Turbo Internet Service:
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unlimited access from 6pm-6am M-F, all day weekends $0.80/MB from 6am-6pm M-F
Sun Surfer Plan $129.95/month unlimited access from 6am-6pm M-F, $0.60/MB from 6pm-6am M-F all day weekends
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Sun Surfer Plan $129.95/month unlimited access from 6am-6pm M-F $0.60/MB from 6pm-6am and all day weekends
Bulk Plan $24.95/month up to 64 MB(approx.. 25 hours online)
Basic Plan $9.95 per month,$0.60 per MB, 6pm-6am M-F and all day weekends $0.80 per MB, 6am-6pm M-F
The above plans do not include ISP charges.
Specifications, contents and pricing subject to change at anytime without notice.

Ken Farver - KB9I - I have my grandfathered First Class Commercial RadioTelephone (now the General Class RadioTelephone) license since 1972, Extra Class Amateur license since 1979, 22 years with Ameritech and can be reached at **kfarver@mc.net**.

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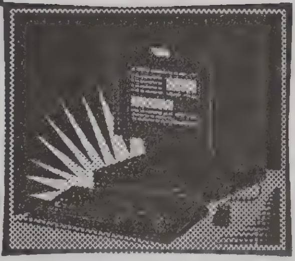

In this column I report on the status of my PBBS system after the switch to TNOS/Linux. I also begin to report on the Linux kernel AX25 networking drivers, and available programs that work with the drivers. But before all that, shameless self promotion! I have recently placed a document on my web page containing details for modifying the Motorola Maxar series UHF radios for 9600 baud packet radio operation. The Maxar provides a very cost effective way to get on 9600 baud packet radio on a shoestring budget. The document can be found at the following URL:
http://www.execpc.com/~ewaldz/maxmods.html

AEA Products Live!
In a past column, I reported the sad news of the demise of AEA, maker of the popular PK232 tnc. Recently, it was announced that Timewave of Minnesota has acquired the AEA digital product line (not antennas), and will continue the development, marketing, and support. Timewave is well known for their DSP based noise filtering products. This could result in a very bright future for the AEA DSP based digital communications products. The details about the AEA product acquisition can be found on Timewave's web page.

Timewave can be reached on the internet at the following URL:
http://www.timewave.com

TNOS/Linux
In my last column, I described the experience of switching my full time PBBS from JNOS/DOS to TNOS/Linux. After running TNOS continuously since then, one word accurately describes the results- SOLID. TNOS/Linux just runs and runs with no weekly lock ups, as I experienced previously with JNOS/DOS.

Since my last column, a new version of TNOS was released which fixed some installation problems, and added a few more features. There are still many features yet to be activated on my TNOS PBBS. Recently, I have activated and configured the White Pages server, the Hypertext Information server, and the Converse server. It is a joy to be able to have all of the features compiled in and activated, and not have to worry about 640K DOS memory limitations.

The major drawback to TNOS/Linux is the fact that it is a big, memory hungry, monolithic program, that actually duplicates some of the features provided by the Linux operating system. This is really an architecture issue that usually bothers the techie purists like me, not really a functional issue. TNOS author Brian, KO4KS realizes this, and has stated that he plans in the future to break out some of the TNOS features as modular stand-alone programs, that could be used as needed, in conjunction with the AX25 and TCP/IP features provided by the Linux kernel. Brian has already made the Converse server available as a separate program (TPP). More on AX25 networking with the Linux kernel later in this column.

JNOS/Linux!
Until very recently, JNOS could only run on DOS, and be compiled with only very specific versions of Borland C compilers (BC3.1 the best). James N5KNX recently surprised the JNOS user community with a new version of JNOS that can be compiled with GCC and can run on Linux. This new version also still compiles with Borland C, and uses the same source code tree. For current JNOS users that don't want to change to TNOS, but want more stability/flexibility, JNOS/Linux offers a nice upgrade path. The porting of JNOS to Linux was actually done several years ago at version 1.09 of JNOS by Brandon KF8NH. The Linux support in later versions of JNOS fell by the wayside until N5KNX the JNOS maintainer recognized the usefulness of JNOS/Linux, and re-introduced the Linux support into version 111x6.

The latest version of JNOS can be found on the internet at the following URL:
ftp://pc.usl.edu/pub/ham/jnos111x6

DPTNT/LINUX with kernel AX25 support
I wrote about the DPTNT/DPBOX pbbs system from Germany some time ago and outlined its' many powerful features. At that time, DPTNT only supported kiss and DED hostmode tncs. Recently, the author of DPTNT's networking program, Mark DL4YBG, announced that he had added support for Linux kernel based AX25 networking to the latest alpha version of TNT. This capability should allow DPTNT to access any device supported by the kernel AX25 network software. This alpha version of TNT only supports AX25 connections, and not NETROM or ROSE protocols, but Mark is currently working on NETROM support for the next release. I would like to point out that TNT can also be used stand alone minus the DPBOX pbbs portion, to provide a very capable packet radio terminal program with many features.

This newest alpha release of the TNT software can be found at the following URL:
http://www.snafu.de/~wahlm/ax25k.html

Linux kernel AX25 Networking
Now that my main pbbs box is running so reliably, I needed another project to haunt my spare time. Linux has supported kernel based AX25 networking for quite a while now. However, past versions of the AX25 drivers have reportably been a little buggy. This fact, combined with the lack of programs supporting the kernel based networking, has kept me from installing the kernel drivers and trying packet radio without xNOS, until now. Recently there have been a few programs starting to appear that support the kernel AX25 drivers including FBB, and DPTNT. Also, many recent reports indicate that the Linux kernel AX25 support has matured to a level that it is quite stable and very functional.

Before touching anything on my Linux box, I downloaded the AX25 how to document from one of the Linux documentation project archives on the internet. This document is invaluable for someone setting up AX25 and Linux for the first time. It covers step by step what you need to do to setup the Linux AX25 networking, along with the locations on the internet where you can obtain patches to the kernel AX25 drivers, and other supporting programs. The AX25 how to, along with many other how to's for Linux can be found at the following URL:

http://sunsite.unc.edu/mdw/linux.html

The first step is to compile a kernel with AX25 support enabled. At this point, you have two options, depending on the version of Linux that you have. If you have the latest stable Linux version (2.0.29 at the time I write this), you can compile in the AX25 support as-is. Or, you can apply some patches to the kernel to bring the AX25 support up to the latest level found in the experimental kernels. If you are brave enough to be running one of the bleeding edge v2.1 kernels, you already have the latest and greatest. I took the v2.0.29+patch route, because the latest drivers have been enhanced quite a bit since the original v2.0 kernels. Besides, the patch is very easy to apply, and the AX25 how to outlines how to set things up based on this configuration. After applying the patch, I compiled a new kernel. The compilation step is very slow on my machine, an old 386DX-40, so I had plenty of time to read the AX25 how to a few times. After gaining an understanding of the configuration details from the documentation, I found that setting up the kernel based AX25 support is actually simpler than setting up xNOS the first time!

I then compiled and installed the AX25 utility suite. The AX25 utilities are a set of applications that allow the kernel AX25 drivers to be initialized, and configured. Also included are some user programs including a highly configurable BPQ-like node program, a personal mailbox (PMS), and a simple line mode terminal program for outgoing connects. When I installed the AX25 utilities, I also chose to install the sample configuration files as a starting point for setup. I then followed the AX25 how to document step by step, and edited the sample configuration files to reflect my setup including callsign, serial port, tnc, etc. It was then time to boot the new kernel and give things a try! After successfully booting the kernel with no adverse problems, I tried attaching my tnc using the kissattach program. This step creates a kiss network device for the kernel drivers to work with. Kissattach also allows you to set some parameters such as txdelay, etc. I was then ready to try an outgoing connect. Using the call program, I tried making some connects to other stations....success! Encouraged by instant gratification, I then enabled the node program, and connected to it using another tnc and radio. It also worked the first time!

That's how my experimental system stands today. All in all, it was very simple to setup due to the sample configuration files, and the well written AX25 how to document. The kernel AX25 support is really a seamless solution to providing AX25 support, and offers many possibilities for the future. The next steps with my system involve trying out the various AX25 features provided by the software. I will also configure and enable the support for TCP/IP connections over AX25 as well. In the future, I will try enabling the personal PMS program, and setup the node to allow other local hams to log into the Linux shell over the air. I will also begin experimenting with the new versions of DPTNT and FBB/Linux.

For more information about Linux Kernel ax25 networking refer to the following URL: **http://www.cs.nott.ac.uk/~jsn/index.html**

Dave Ewaldz - N9HKM
ewaldz@execpc.com
n9hkm@n9hkm.#ncil.il.usa.noam

Dave Ewaldz - N9HKM - Dave has been a ham for over 17 years. Dave discovered packet radio in about 1986, and has operated packet radio nodes and bbs's in the Northern Illinois area since that time. Professionally, Dave is a control systems engineer. His email address is:
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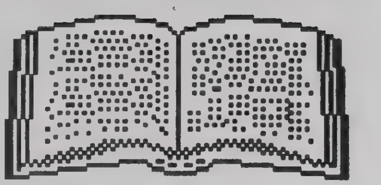
A Review



Radio Monitoring The How to Guide

Have you ever wanted to tune into the world and listen to satellites, the space shuttle, aircraft, the military, ships at sea, emergency services and so forth without leaving your living room? There is is a new book out that will help you do that and more. Radio Monitoring The How to Guide, written by T. J. "Skip" Arey, WB2GHA, and published by Index Publishing Group, is a complete "hands on" guide to the hobby of radio monitoring written in an informative and easy to read style. It is written with the beginning radio monitor in mind. This book shows how to get started in the hobby with just a standard AM broadcast band receiver that is already in your home or car. It made me want to stop reading and turn on my AM radio to see what I could hear.

There is a discussion of different kinds of equipment for mediumwave, shortwave and VHF/UHF. Each section discusses what to look for in sensitivity, selectability and stability, accessories, propagation, monitoring techniques, club and organizations and what you can hear on each mode. All this while trying to help keep the cost down to fit within your budget by giving ideas about where to get the monitoring equipment.

The appendixes give a list of equipment suppliers and radio frequency allocations and a list of on-line services that support the radio hobby.

There is a lot of information packed into the 340 pages of this book and it is already a selection of the McGraw Hill Electronics Book Club.

Radio Monitoring The How to Guide retails for $19.95 and is available from Index Publishing Group, 3368 Governor Dr. Ste. 273, San Diego, CA 92122. Toll free order line: 1-800-546-6707; 619-455-6100 Voice; 619-552-9050 Fax : E-mail ipgbooks@indexbooks.com

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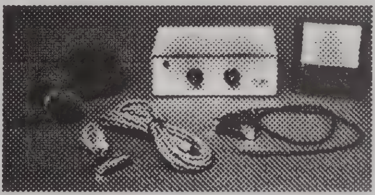

AAI / WX..Detects and logs atmospheric or artificial events. Analog to digital converter, Square law detector, 8 or 4 ohm input audio, output port to your recording device, selectable time constant inputs, level adjust for input & output to your computer with our software for monitoring, logging, playback or real time viewing of signals. Includes the RWC1 circuitry so you have the ability to view the digital signals or record events as they happen. Includes software driven relay for turning on or off an external device when predefined levels are reached. This is a single solution unit for monitoring & logging.
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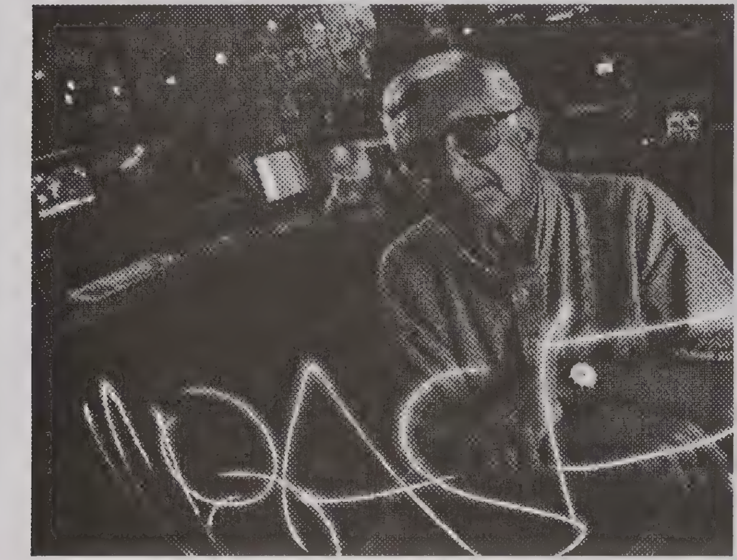
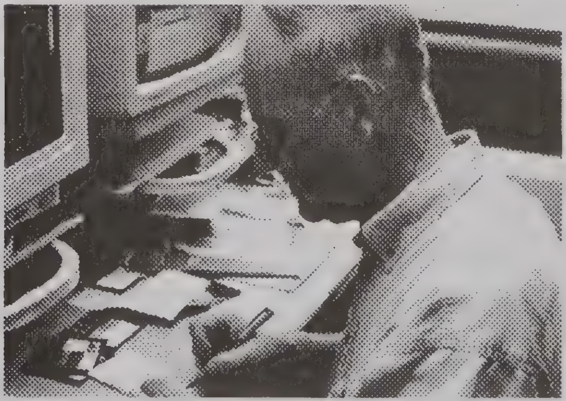


From time to time in this column, I have mentioned Dr. Stephen Padar and his remarkable satellite receiving station. Well, this issue I will give you a personal look at Steve and some nifty (I hope) pictures.

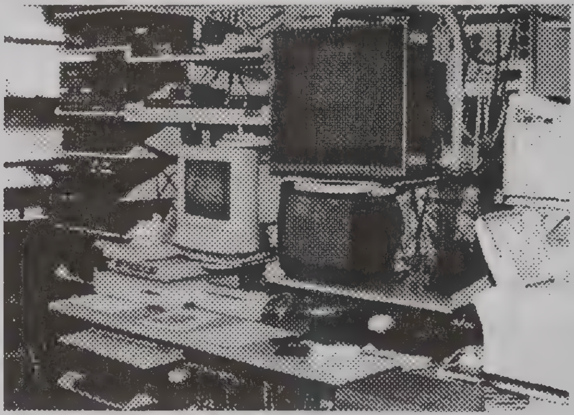
Steve has a home on the bayfront here in Sarasota, about 10 miles from my house and my satellite receiving station, but there the resemblance stops. On a recent trip to Budapest, Hungary, Steve was shown through the main weather bureau. He confided in me that he had better and more complete equipment than they did. It's really not any wonder. Steve has had a passion for weather satellites for many years. Steve attends most all satellite seminars, no matter what part of the globe they are in. He is a highly respected member of the Drig Group in Dayton and the Rig Group in England. Not to be left out, I'm a member of both of those groups too, but have not made the contributions in papers and satellite pictures that Dr. Padar has.



Steve recently retired as a neurosurgeon in private practice and is on the staff at Sarasota Memorial Hospital. I remember when I first moved here seven years ago, we had lunch and Steve gave me a special tool of his trade, a special drill used to drill the skull in brain surgery. I still have it but haven't found a skull to drill as yet!

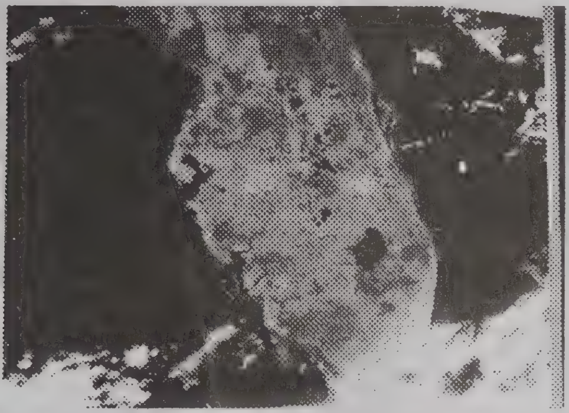
TRY AND TOP THIS FOLKS!

Dr. Padar was inspired to get into weather satellite reception by reading Dr. Ralph Taggarts book, "The New Weather Satellite Handbook" an ARRL publication. I have, on numerous occasions recommended this book to people interested in getting started in Weather Satellites. It still remains the best.



Steve's receiving station consists of 10 computers, using OS2, Windows 3.11, Windows 95 and Windows NT. All these outputs are sent to two video switch boxes that select the output of any of the 10 computers on 5 monitors, consisting of three 15 inch high resolution monitors, a 17 inch and a 19 in NEC Multiscan! WOW! Satellite pictures take up a lotta-lotta memory, some in the 500 megabyte range. For that reason Steve has loads of hard drive space (on 10 computers) and a writable CDROM, which will store upwards of 600 megabytes. Naturally he also has a DAT recorder (Digital Audio Tape). As illustrated in some of the pictures you can see his latest improvement, which consists of prefabricated racks. Steve had no more room to spread out so he spread up,

stacking equipment, as illustrated. He receives APT, HRPT and GVAR pictures, which have enough resolution to see hard crisp shorelines on tiny islands. I am including a GVAR picture of Florida that is almost three dimensional it's so crisp. Some of his programs permit zooming sections of pictures with no apparent loss in detail or resolution.



Dr. Padar has a full retinue of receivers, using the Kenwood R-2000 (like mine!) with modification to increase bandwidth for Polar Orbiter reception. These satellites orbit around the earth and over the Poles, hence Polar Orbiters. They are about 600 miles up and are received on a Quadrifiler Helix antenna which does not track the satellites, but instead is pointed straight up in the sky and because of it's construction, is able to "see" from horizon to horizon. I use this type also. Steve's "antenna farm" consists of the q-f-helix, along with a number of dishes, some, as you can see in the photo are (I'm guess-ti-mating) 15 feet in diameter and are AZ-EL mount so that they can track satellites through their travel. At one time Steve thought of putting a tiny solid state TV camera on the AZ-EL mount, so that he could display the satellite traveling in the night sky. I think this idea was scrubbed because of the fact that all satellites are not backlit by the Sun and the tiny orbs are just not that visible in the night sky. How did Galileo see all this great stuff?? Maybe that's all a fake and Galileo lived in 1975. I get a little goofy, writing about this wonderful station. I think Steve has about 10 receivers also, ranging from those, with demodulator that can fit in the palm of your hand, up through special receivers. I might mention that one of the big dishes is a TVRO dish so that we can enjoy pictures live, from the Space Shuttle flights.

MORE and MORE and MORE.....and MORE

Dr. Padar has a number of printers and uses laser printers on high resolution pictures. Among the accoutremental software is WEATHERNODE which I have written about in the last issue and is a program that transmits weather data, pictures, satellite pictures and weather warnings 24 hours a day, drawing on numerous services for a constant stream of data. Then there is Winweather which is software that draws upon the Internet for it's satellite pictures and weather information. All satellites are available in this program. Steve uses the INSTANTRACK satellite tracking program which also runs his AZ-EL mounts. I believe this is still the most complete, easiest to use tracking program as yet. According to Steve, The National Weather Service in Budapest, Hungary uses it. Writing a column on Weather Satellites, I'm fortunate to have Dr. Padar only 10 minutes away from me.

WELL NOW...HERE'S ABSOLUTELY "INSANELY GREAT SOFTWARE"

I don't know why, but the above phrase reminds me of Thomas Monkenmeier,who wrote VGACOPY, which is a disk formatting program with Tom shouting things on an audio track. I use it to format 3-1/2" disks to 1,722,000 and 1,785,000 bytes. Satellite pictures take up a bunch of memory and I need the extra 300 to 400KB.

Now to tell you about an ISG shareware program called WINWEATHER. This program automatically connects you up to the internet (providing you have a browser) and furnishes weather satellite pictures available from GOES East and West, Meteosat,etc in both the IR format and Visible light format. You have the ability to zoom and computer enhance slightly, save and copy.

Probably no description is as good as the one coming from the "horses mouth" I therefore quote, "WinWeather is a shareware program that brings you hourly weather reports and forecasts, Satellite images (and WeatherCams) and ski reports direct to your PC. With an Internet connection, you'll be able to get the latest weather and weather reports on cities all over the United States and around the world. No need to remember strange Internet addresses if you can click a mouse, you can use WinWeather. It's available in 16 and 32 bit". The Weathercams mentioned above are live shots of various American and Foreign cities and places. For example, I selected "Florida" and then "Tampa" and got a live view of Tampa. If you select the same thing at night, you'll get the same view, but with the city lights on. There are camera views of Germany, Norway, etc. The list is long.

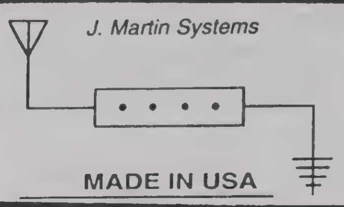
The satellite selection is Goes E, Goes W, Meteosat, all in both IR and Visible light. The Meteosat picture of Europe is false colored with brown land masses, blue water and white clouds. The program also has full ski reports and an addressable menu for selected cities, giving their current weather, temperature, humidity, pressure and winds. I have kids in Nashville and Fayetteville, and my hometown is Cleveland, so I display all these reports in one concise box. Beats looking in the morning paper. To support it, the cost is only $19.95 "Insanely Great Software" also has other excellent programs. To log on to their website use:
http://www.igsnet.com/igs
and download WinWeather. It has my highest recommendation.

THE SCANNING IS VERY SLOW THESE DAYS

With propagation at about it's lowest level that I can remember (I've been a ham for over half-a-century!!), hearing someone on SSTV these days is about as rare as finding Amos and Andy on the radio, consequently my contribution to the SSTV field this issue will be a little skimpy.

There are a few news items that bear mentioning however. Don Rotier K0HEO and his program WinPixPro for Win 3.1 and Win 95 uses the Sound blaster card. Don has a website where you can download trial software. It's:
http://www.skyport.com/~K0HEO.

Another SSTV program for Windows 95 only by Jim N7CXI is called W95SSTV ver 1.03. You can download a beta version at:



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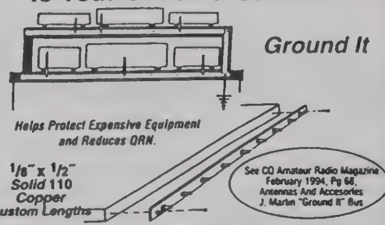

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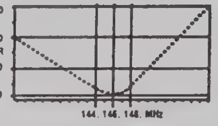

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http://www.wolfe.net/~jlbarber/sstv.htm. Tom Jenkins N9AMR has a new version of HIRES called HIRES 4.0. I'm told it's excellent. Details when I get them.

Martin G3OQD has released a new picture transmission mode on his release Ver 4.6 for Robot 1200C, Superscan 2001, Ribbit and the LM9000. For those not familiar with Martin, he makes an Eprom for the above scanners and this is his latest Version 4.6 upgrade. This new mode is called Martin HQ and at present it operates in two speeds: 90 Sec (HQ1) and 112Sec (HQ2). The new modes supposedly show a marked improvement over Martin 1 and Scottie 1...More later.

A few things I'll try and do in future is some small circuitry, like variations on the HAM-COM interface and more SSTV news, if that's possible.

for now...CIAO

Fred Sharp W8ASF

Fred Sharp - W8ASF - Fred is very active in SSTV and weather satellites. He has written articles for SPEC COM Magazine. His email address is **f.sharp@postoffice.worldnet.att.net.**

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World Wide Programming with Visual Basic 5

Brian Boyer

This month Microsoft revolutionized the world of programming with their release of Visual Basic v.5.0. I received my copy last week and I am already very impressed. VB5 includes some long awaited improvements to standard controls, language syntax, and the development environment. Moreover, VB5 includes features that will dramatically change the way software is developed and deployed. Thus, the subject of my column this time will be to review some of the enhancements and new capabilities that Microsoft has included in VB5.

But before I jump into VB5, I wanted to say "Kudos" to Mr. Keith Skutt for his implementation of the "CyberSimon" application that I presented in the Nov/Dec issue of CyberHam Magazine. Keith emailed me a copy of his implementation that had several neat enhancements. I enjoy receiving feedback from the readers of my column, and I always try to help out fellow VB programmers as much as I can. So, feel free to email me with any comments or questions you have regarding VB, multimedia, or computing technologies in general. Once again, I would like to say thanks to Keith for sharing his CyberSimon implementation.

Like VB4, Microsoft is offering VB5 in three tiers. Each successive tier provides increased functionality, but costs more. VB4's tiers were named Standard, Professional, and Enterprise. VB5's tiers are Control Creation, Professional, and Enterprise. I will cover each tier and their respective capabilities in detail below.

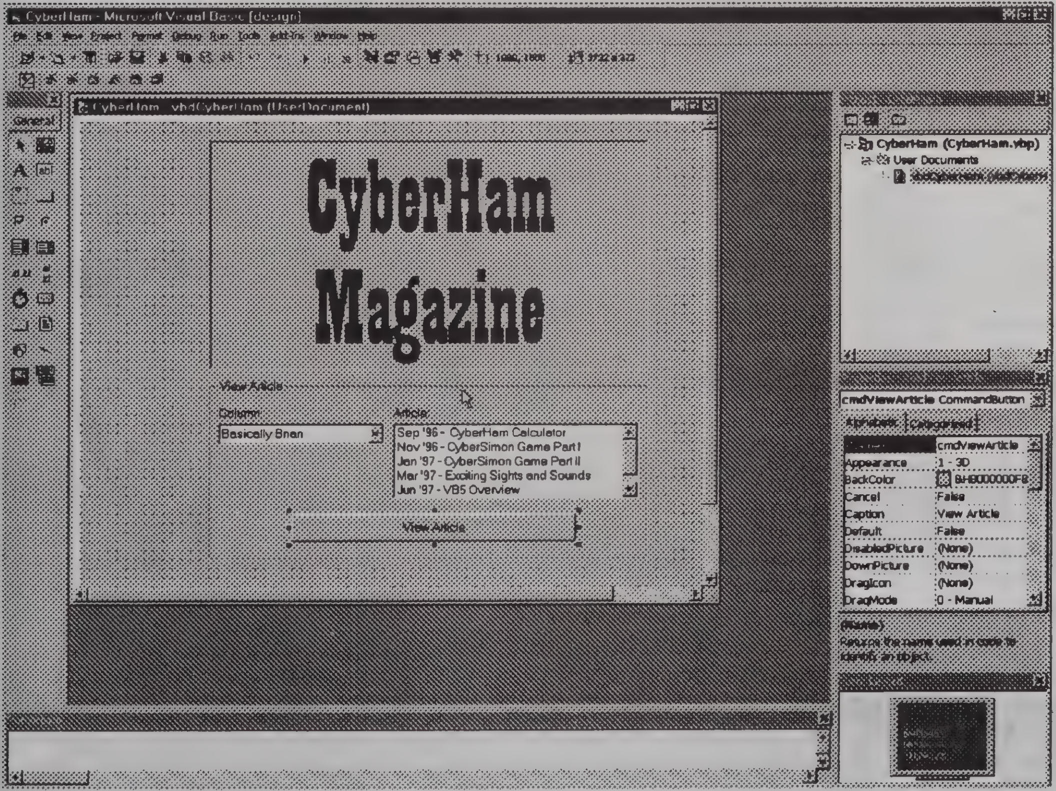
Control Creation Edition

The first thing to note about VB5CCE is its price. If you have an Internet connection, you can download it for *FREE* from **www.microsoft.com/vbasic**. The download is approximately 7.1MB. So, with a 28.8K modem it should take about 41 minutes.

VB5CCE, like the Professional and Enterprise tiers, only runs on Windows 95 or Windows NT. Furthermore, VB5CCE only creates 32-bit controls. VB5 Professional and Enterprise can create 32-bit controls, .EXEs and .DLLs. Thus, it is important to note that Microsoft has completely moved into the 32 bit world with VB5. Windows 3.1 and Windows For Workgroups development has stopped with VB4.

Microsoft recommends a minimum of 16 MB of RAM for Windows 95 and 32 MB of RAM for Windows NT. Microsoft also recommends installing Service Pack 2 on Windows NT before installing VB5.

The first thing you will notice about VB5 is the new look and feel of the development environment. VB4 was a Single Document Interface (SDI) application. Thus, managing code windows and forms was sometimes awkward because it sometimes required extra clicks and keystrokes. VB5 is a Multiple Document Interface (MDI) application (like Excel or Word), so it is easier to manage elements of the development environment. *Figure 1* shows the new VB5 development environment.



Column:

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Article:

Sep '96 - CyberHam Calculator
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cmdViewArticle CommandButton

(Name)	cmdViewArticle
Appearance	1 - 3D
BackColor	&H8000000F&
Cancel	False
Caption	View Article
Default	False
DisabledPicture	(None)
DownPicture	(None)
DragIcon	(None)
DragMode	0 - Manual

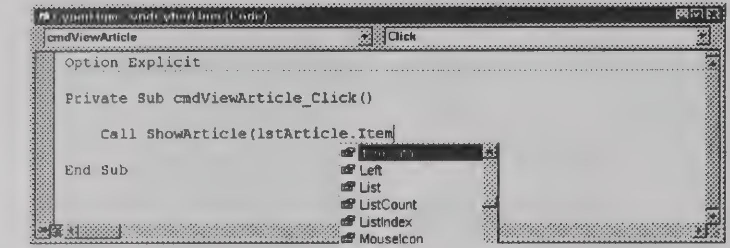
(Name)
Returns the name used in code to identify an object.

Figure 1 - The New VB5 Development Environment

Microsoft has also included their IntelliSense™ technology into VB5 which provides prompts that guide the programmer through syntax. *Figure 2* shows IntelliSense in action.

Figure 2 demonstrates how VB5 presents the properties and methods of objects in a listbox for selection. This listbox progressively shows properties and methods of an object or control as the programmer types which helps eliminate syntax errors due to typographical mistakes.

Microsoft has also included Books Online in the VB5 environment. Books Online is a complete set of tutorials and reference materials. I used the tutorials included with Books Online to create Active Documents and ActiveX controls which are new to the Visual Basic environment. I found the use of Books Online to be easy and intuitive. Moreover, the ability to copy code from the online tutori-



```
Option Explicit

Private Sub cmdViewArticle_Click()

    Call ShowArticle(lstArticle.Item

End Sub
```

Figure 2 - IntelliSense in Action

als directly into the VB5 environment is very convenient.

VB5 also includes the capability to work with multiple projects concurrently in the development environment. I have created many OLE Automation Servers with VB4 which required me to run multiple instances of VB4 (one for the OLE client and one for the OLE Server) which was a pain and sometimes confusing. VB5 addresses this need by providing the Project Explorer which provides a tree view of the projects associated with a project group. Now it is possible to have the server code and client code visible in the same development environment.

Finally, VB5CCE has the capability to create ActiveX controls. ActiveX controls are basically the same as OCXs and their 16-bit predecessors, VBXs. They allow the developer to encapsulate program functionality into an object that can be placed onto a VB form. For example, a developer could create a speedometer control that would display an analog gauge. The gauge control would have minimum speed, maximum speed, current speed, total miles traveled, and trip miles traveled properties that could be set in the same fashion as the caption property of a command button. Once this functionality is created, the developer can use it in the same repetitive manner and it will behave consistently. Thus, the developer can forget about the details of the control's construction. Moreover, ActiveX controls can also be used in the Visual C++, Visual FoxPro, Visual J++, and Access development environments. ActiveX controls can also be used in an HTML document and controlled with VB-Script or JavaScript for Web publishing. Thus, ActiveX controls allow the developer to create units of functionality and reuse them in different development environments without worrying about the details of the controls implementation.

Professional Edition

The next tier of VB5 is the Professional Edition. Once again VB5 Professional will only run under the Windows95 or Windows NT operating systems. VB5 Professional requires between 30 and 115 MB of hard disk space depending on the number of components that are selected for installation.

VB5 Professional includes the environment and capabilities of VB5CCE plus the ability to create standard Windows applications. However, applications created with VB5 Professional are faster and more efficient than those created with VB4. VB4 applications actually consist of P-Code which is interpreted by the VB run-time library. This interpretation process is very slow compared to compiled programs created with Visual C++ or Borland's Delphi. With VB5, Microsoft has included its native code compiler which creates applications 20 times faster than VB4 applications. Moreover, Microsoft has overhauled their form generation engine so that form operations are 17 times faster than VB4. The Delphi advocate's main argument against Visual Basic, application speed, has now been dispelled.

Microsoft has also included several new controls with VB5. Because I like graphically flashy applications I believe I will use the new Animation Control quite often. This control allows the inclusion of silent AVIs on forms and dialog boxes. The familiar piece of paper that files between the two folders during a file copy or move in the Microsoft Explorer is a good example of a Silent AVI. Almost all of my day to day work currently involves the Internet, so I will be using the new Internet Transfer Control and the Winsock Control included with VB5. The Internet Transfer Control allows easy access to HyperText Transfer Protocol (or HTTP - the main protocol used for Web browsing) and File Transfer Protocol (or FTP - the protocol used to move files to and from remote computers). The Winsock Control allows applications to exchange data using the Transmission Control Protocol (or TCP - a connection oriented protocol) and User Datagram Protocol (or UDP - a connectionless oriented protocol). These new controls will allow flashy Web-Centric applications to be implemented with ease.

Figure 3 shows one of the most exciting new features of VB5, Active Documents. Active Documents basically allow the developer to create and deploy applications across the Internet and view them in a Web browser. The Active Document in *Figure 3* allows a user to view any of my previous columns in CyberHam. This is truly awesome! Now interactive Web sites are simply a few textboxes, labels, and buttons away! Hats off to Microsoft for including Active Documents in VB5!

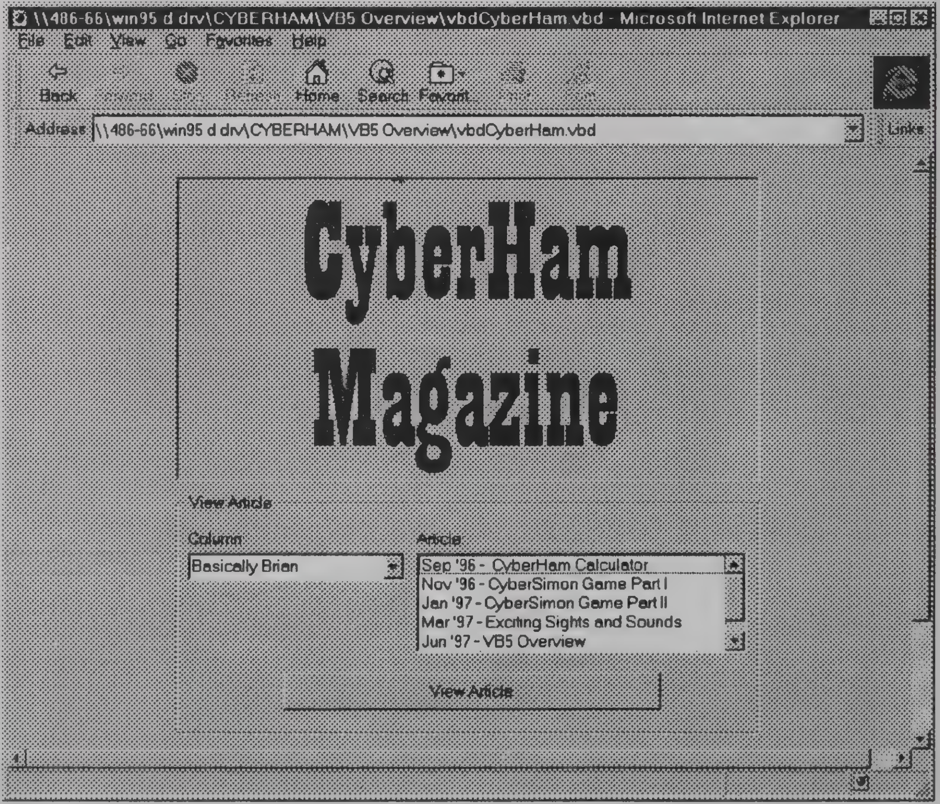


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Figure 3 - Active Document on Remote Computer Viewed in Internet Explorer 3.01

Enterprise Edition
The third tier of VB5 is the Enterprise Edition. It includes all of the features and capabilities of VB5CCE and VB5 Professional Edition, but it adds a lot of new and enhanced tools for the enterprise-wide developer. The Enterprise Edition requires between 35 and 345 MB of hard disk space depending on the components installed.

Like the CCE and Professional versions, VB5 Enterprise requires Windows 95 or Windows NT; however, the Enterprise Edition can run on a RISC hardware platform running Windows NT. RISC (Reduced Instruction Set Computing) is a type of microprocessor pioneered by the PowerPC coalition. There are several RISC microprocessors on the market including PowerPC, MIPS, and Alpha. Microsoft originally supported all three processors with Windows NT, but over the past two years they have reduced their RISC support to Alpha exclusively. This is the first time a non-Intel based microprocessor has been supported by VB. Digital (the makers of the Alpha microprocessor) recently announced a price reduction of their 500 MHz Alpha, so the future should be very interesting!

Remote Data Objects (RDO) has been promoted to version 2.0 with VB5 Enterprise Edition. Version 1.0 provided for "Jet-like" access to remote data eliminating the need to make ODBC calls against a remote database. Thus, RDO 1.0 lowered the learning curve of interacting with a remote data source. Version 2.0 increases remote data access performance and is based on the Rushmore™ technology set found in Visual FoxPro. RDO 2.0 includes new classes that support batch processing of database queries, events that allow asynchronous database operations, and the independent instantiation of certain RDO objects. These improvements will undoubtedly ease the development and increase the performance of three-tiered applications.

VB5 Enterprise includes Microsoft's software configuration management tool, Visual Source Safe 5.0. I use Source Safe on a daily basis and in my opinion it is an essential tool for any serious software developer. Source Safe allows the developer to track the progress of a software project and any related information, like documentation, throughout the development process. Project files, source code, graphic and sound assets, and other related files are checked into the Visual Source Safe library. Developers can check out these files, modify them, and check them back into the library from within the Visual Basic environment. While a file is checked out, only one developer can modify the source code. This check in/check out process allows many developers to work on one project without fear of stepping on each others toes. Moreover, undesired changes can be "rolled back" to their previous state. Version 5 includes new Web management tools and other capabilities like cloaking which hides a project and its subprojects from changes. Version 5 also includes enhanced history tools like "difference" which will show the developer what has changed between two versions of a file.

A new addition to the Enterprise tier is the Application Performance Explorer, or APE. APE allows the developer to test the performance of multi-tiered applications on various network topologies and server capacities. Determining the performance of a distributed application before its deployment affords the developer a huge advantage. Another nice quality about APE is that that it is written in Visual Basic. Moreover, Microsoft has provided the source code along with VB5 Enterprise. APE is not only an essential tool, it is also a fine example of how to write a distributed application.

VB5 Enterprise includes so many tools that it is impossible to cover all of them in the limited space that I have been allocated; however, Microsoft's inclusion of powerful database design tools is a nice touch.

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The Visual Data Manager allows the developer to design and populate various databases from directly inside the Visual Basic environment. Microsoft has also included the developer versions of Transaction Server and SQL Server with VB5 Enterprise. These tools are essential to the development of client/server database applications.

Summary
I am truly excited about Visual Basic 5. I believe that VB5 is the most powerful and easy to use development tool that I have ever used. Its control creation and Active Document capabilities alone excite me, but its improvements in language syntax and included tools make an assertion of how serious Microsoft is about maintaining Visual Basic's popularity in the software development world. Microsoft reports that there are over three million developers using Visual Basic and I guarantee that most of them will be just as excited as I am about this new release!

Brian Boyer is a technical consultant in the Northern Illinois/Southern Wisconsin area. He enjoys programming with Visual Basic, C++, Java, and Delphi. Most of his time is spent researching and applying multimedia technologies. He is an avid user of 3D Studio Classic and 3D Studio Max. He can be reached at **bboyer@earth.inwave.com**

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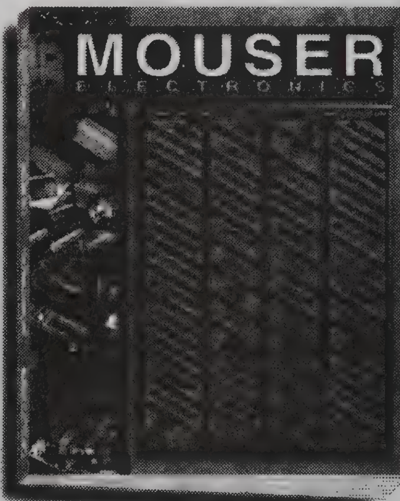

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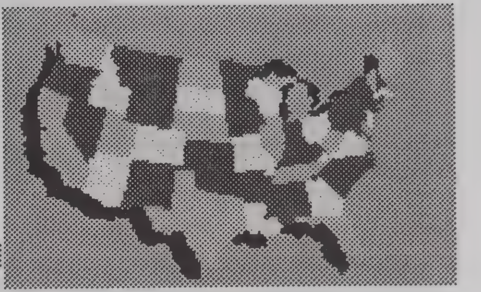
AUTOMATIC PACKET REPORTING SYSTEM (APRS)

Bob Bruninga - WB4APR



USING APRS IN WEATHER AND SKYWARN APPLICATIONS

OVERVIEW: The graphical and map displays of APRS make it an ideal tool for reporting weather conditions via packet. Not only can real time weather data be plotted automatically on the maps, but also over two dozen weather symbols are provided for tracking storms and weather conditions as they move through an area. Figure 1 shows a typical map display with many of the active APRS WX stations in the central states. These amateur stations use APRS for skywarn because of its many capabilities:

MAP DISPLAY - Shows the location of all reporting stations, their wind speed and direction. Can also show the location of DOZENS of other WX symbols or objects... WX-WINDflow displays wind contours.

WX SYMBOLS - There are dozens of WX symbols such as TStorms, Hail, Tornados, etc in APRS. You can even mark large areas with either a rectangle, circle, triangle, or lines using the OBJECTS-AREA symbols.

WEATHER ONLY - The JUST-WX command for a temporary display of only WX stations on the map or P-List. The N-NEXT command cycles through each WX station in turn with a circle on the map and displays its' wx conditions at the top of the screen.

WX REPORTS - Station weather conditions can be manually entered with the WX-ENTER command or automatically using the optional APRS WX registration and home WX station. These reports are typically broadcast every 9 minutes or on demand in respond to a WX-QUERY.

STORM/HURRICANE TRACKING - Any station may place a storm or other object on his map, and it will be transmitted to all other stations. If a course and speed are given, then it will be automatically dead-reckoned on all screens. Any station can update the location of such an object and will become the new reporting station. This prevents duplicate reporting. For tropical storms a special COMMENT format will cause APRS to color hurricanes red, tropical storms yellow and depressions blue. It will also show the radius of the winds with colored circles.

TRACKING STORMS AND MOVING WEATHER SYSTEMS: APRS dead-reckons moving objects, so the symbol on the map is presented where it SHOULD be, NOT where it was when first reported. To hook one of these objects on the map, you must hook the little gray circle which marks the position of the actual report, and not the symbol itself. After two hours with no update, the symbol fades to dark gray. Figure 2 shows the typical APRS display of tracking Hurricane Bertha back in 1995. The track of the hurricane was coming in via the national HF APRS tracking frequency on 10.151 LSB and all of the local activity near Washington DC was on our local VHF frequency of 145.79. Notice that while the storm was approaching the coast, we were also having thunderstorms in our area.

NATIONAL WEATHER SERVICE DISPLAY - Suggested by KD4UYR in FLorida, this feature parses NWS hourly bulletins (SA's) and plots the WX data on the map. NWS sites now have a different symbol from home WX sites.

AUTO-HURRICANE TRACKING - At the suggestion of KR4US I wrote NWSPARSE.bas which will parse incoming NWS bulletins on one COM port, and output APRS storm symbols and tracks via a TNC on the other COM port. Using an old PC, this system can automatically inject WX storms into APRS nets! It needs more work and additional parsing.

ON-MAP-WX DISPLAY - You may select to have the WX conditions displayed by each WX station instead of the callsign. There are two formats. One is activated by the WX-DISP-TIME command shows the TIME, Barometric Pressure, sustained wind and peak wind. The other is activated by the WX-SHOW-TEMPS command. It substitutes Temperature for the TIME:

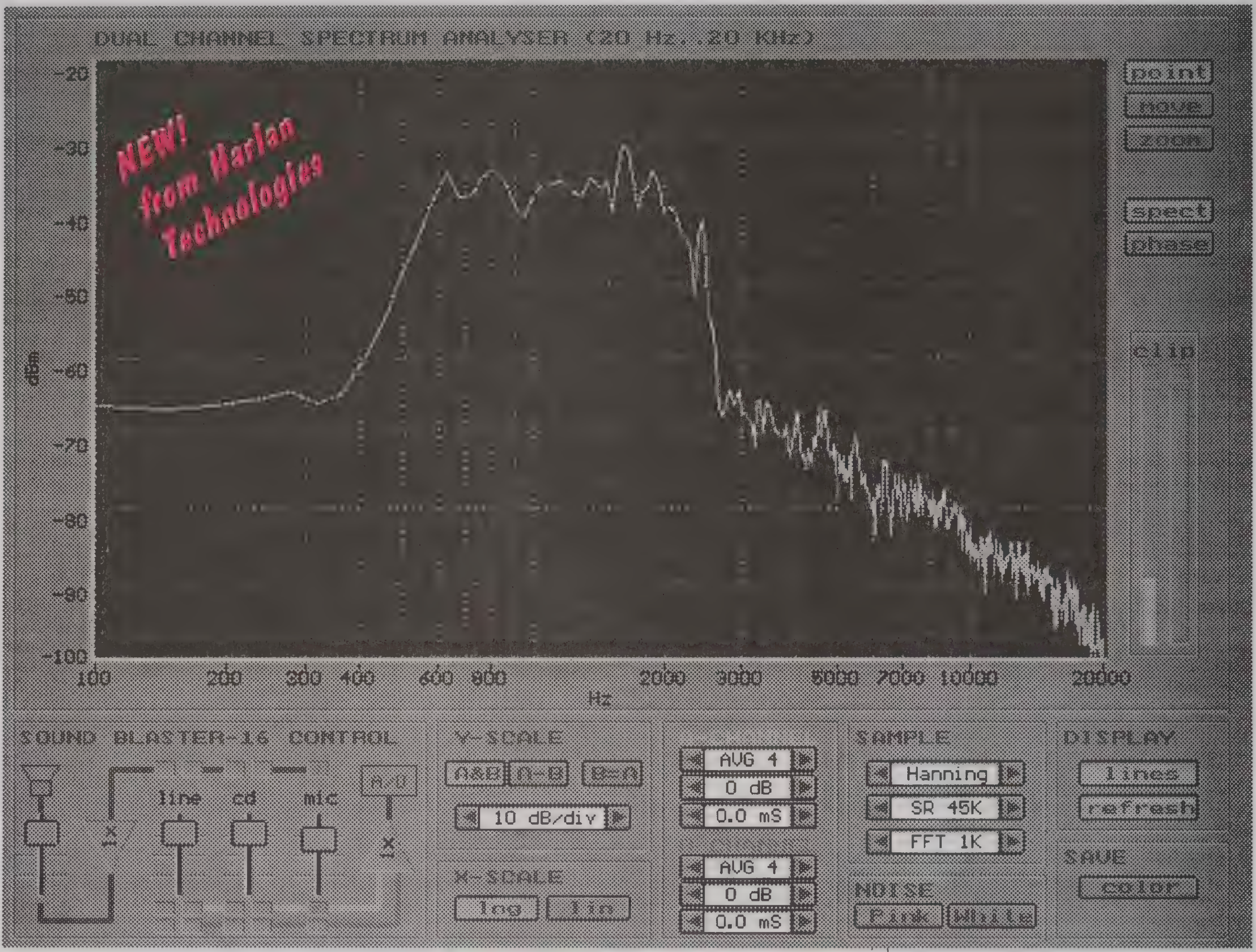
1420z9764/36/45	Time,1420. Pressure 976.4. Wind 36 gusts 45
076øF9764/36/45	Temperature of 76 degrees Fahrenheit

OPERATOR MESSAGES - The Point-to-point message capability can be used for operator to operator messages and alerts. With FILE-PRINT enabled, these messages and WX reports can be scrolled to the printer.

In addition to weather data included in position reports, the station STATUS packet is also available for broadcasting additional info. These STATUS packets can be reviewed on the LATEST display. The APRS BULLETIN feature is very powerful as an alerting mechanism to all stations on the net. Even non-packet voice stations making a weather report can be placed on the map (like an object) by another APRS packet operator. His station will appear similar to any other APRS weather station, except that his report will include a marker indicating that he was manually placed on the map by another operator.

WX ALARMS: If a WX report comes in that exceeds your alarm values, the station is plotted in RED and an ALARM sounds. The alarms are WIND, TEMP, and RAIN. These settings can be used to warn of the passing of a warm or a cold front. Use APRS and these alarms to make an almost un-attended SKYWARN network! Install an APRS computer at the NWS site, and let the NWS operators set the alarm levels. Then without transmitting a single packet (there is rarely a licensed HAM on the premises) the APRS screen will show SKYWARN data and where the alarm conditions are!

WEATHER WARNINGS AND WATCH BOXES: You can use the OBJ-AREA-LINE command to draw a box plus-or-minus X miles from



10 dB/div

AVG 4
0 dB
0.0 mS

AVG 4
0 dB
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a line between points A and B. The line and width are perfect for WATCH and WARNING boxes. If baseline lengths longer than 400 miles are needed you must combine two or more boxes.

HOME WEATHER STATION INTERFACE: With the optional weather registration, APRS inserts the ULTIMETER or DAVIS conditions in your position report for unattended weather reporting.

RAIN VALUES: In the Ultimeter-II, two rain count accumulators are incremented every time the rain gage clicks (either 0.1 or 0.01) Since the raw U-II rain values have no meaning without knowing when they were last reset, APRS only transmits the difference in rain for the last 60 minutes (/Rxxx) and the last 24 hours (/Pxxx) (P for Precipitation). A reading of /R123 means 1.23 inches fell in the last hour. A reading of /P164 means 1.64 inches have fallen since the same hour yesterday. For a REMOTE U-2000, this P value means rain since MIDNIGHT. For a remote U-II the raw rain count is displayed as #nnnn and there is no P value since there is no PC at the site to calculate rain rates.

FORMATS: The following formats are the way that APRS re-formats the data from the attached WX unit and transmits the data on the air. For remote Ultimeters, where there is no PC, and the TNC is just transmitting the raw Ultimeter format, then these formats represent the way that APRS parses and displays the received data on the POSITIONS-LIST.

.../LAT/LONG_CSE/SPD/TxxxRxxxpxxxgxxx/U2a	Original U-II auto
CSE/SPD/Txxx#xxxxp.../U2r	Original U-II remote
CSE/SPD/TxxxRxxxpxxxbxxxxhxxgxxx/dvs	Davis WX station
CSE/SPD/TxxxRxxxpxxxbxxxxhxxgxxx/U2k	U-500/2000 with APRS
CSE/SPD/TxxxPxxxbxxxxhxxgxxx/U500r	U-500 remote
CSE/SPD/TxxxXxxxbxxxxhxxgxxx/U2kr	U-2000 remote

Where: CSE/SPD is wind direction and sustained 1 minute speed
T is in degrees F
R is Rain per last 60 minutes
P is precipitation per last 24 hours
B is Baro in tenths of a mb with leading 1 omitted
H is humidity in percent. 00=100
G is Gust (peak winds in last 5 minutes)
# is the raw rain counter for remote WX stations
See notes on remotes below

With the WX interface enabled, the normal APRS decaying of position/wx reports still holds as long as nothing changes (except the wind). This way, redundant WX reports do not cloud the channel. If any value, position, temperature, rain, barometric pressure, or comments change, then the periodicity is reset to the value set in the alt-SETUP-POSrate command. Since the wind is the most changing parameter, the WX-WIND command can be used to set a Wind threshold. Whenever the wind is above that threshold, the reporting period is also reset to the POSrate value. Nominally, you might want to set the POSrate value to about 4 minutes or so. This way, during changing WX conditions, or wind above your threshold, the WX is reported every 4 minutes. Otherwise, the period rapidly decays back to the maximum APRS delay period (default is 20 minutes). For a weather station, you might want to change this MaxPeriod to maybe 10 minutes or so. Use a text editor to change this value in your CFIGxxx.APR file. There it is expressed in seconds. Of course, a WX/position report will be transmitted by the APRS station at anytime, in response to an APRS or WX query.

ULTIMETER INTERFACE CABLE: Peet Bros sells an interface cable with a DB-25 connector to RJ-11. (Note, this is a DB-25, not a DB-9). Since the U-II has no negative supply, a 5 K pulldown resistor is added to the DB-25 connector between Pins 2 and 3. This uses the -5 or -12 volts on your TXD line to bias the RXD line. The Peet Bros cable includes transient protection and RF filtering to protect your computer as well as providing the bias resistor. Remember, the anemometer is like an antenna, high in the air. It can radiate RFI and take lightening charges. The U-2000 is directly RS-232 and needs no pull down resistor. Be sure the U-500/2000 is in DATA-LOGGER mode.

DAVIS INTERFACE: You must have the DAVIS Weather Link serial interface option before your Davis station will output serial data. Simply connect their connector to your PC. You MUST use the APRS alt-SETUP-OTHER-AGL command to set your average ground level. This converts your barometer readings to their equivalent value at sea level. Your objective is to find an exact AGL that will result in your BARO readings matching the readings on your instrument or local NWS. This AGL will probably NOT be your true AGL.

REMOTE ULTIMETER OPERATION: Only the Ultimeters from Peet Bros can be used as remote WX stations (using only the WX station, a TNC and a radio). This is because they output continuous data needing a PC to interrogate it periodically. There are two ways to time the transmission of this data for the packet channel depending on what Ultimeter you are using. We call these PACKET mode or DATA LOGGER mode.

DATA LOGGER MODE (GPS mode):

For the DATA LOGGER mode, the TNC must do the scheduling of packets just like the TNC does for continuous GPS data. That is why this mode is often called the GPS mode even though GPS has nothing to do withe Weather. You must program your TNC to think that the WX data is GPS data. Simply program the stand-alone-TNC to recognize the #, * or !! instead of the usual $GPRMC data typically used for GPS. Then set the timing for each transmission to be about once every 5 minutes. Be sure to SET ECHO off if your ULTIMETER-II uses a resistor on the TXD line to bias the RXD line! (Otherwise you will echo all packets back onto the channel! KD4GOE figured that one out!).

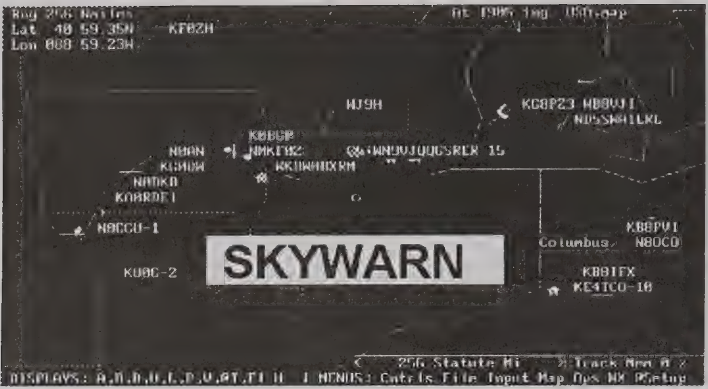
PACKET MODE :

This mode was designed for APRS packet since the WX unit only outputs a single data line every 5 minutes. Since it is already timed to once every 5 minutes, all the TNC has to do is be in UI CONVERSE mode and it will send the packet. Be sure to use a TNC that can be configured to power-up in UI-CONVERSE. Try UIMODE or PMode-CONV depending on your TNC. Also you must set LFIgnore to ON so that the LF after the CR is not transmitted..

WX POSITION: In both cases, you must put the unit's POSIT in the BText using the "_" WX symbol. This way the TNC transmits two packets, one is a BText WX posit with no WX data, and the other is raw WX data with no posit! APRS cannot display the WX on the map until it has received a WX posit beacon. So, set the beacon to go about once every 20 minutes. Once the posit is received it will be displayed as a Blue dot.

DATA LOGGING: Use the WX-LOG command to toggle on and off the automatic saving of all WX data to the track history file. If WX log is off, then only the positions of GPS stations and moving objects will be tracked.

Figure 1. This APRS display shows a number of APRS WX stations



on the air over a year ago. APRS continues to grow all across the country and amateur APRS stations are getting excellent support from the National Weather Service. Not only does the wind vector show for each station, but the Temperatures, Barometer and Rainfall can also be displayed (although it would severely clutter the map at this large scale.)

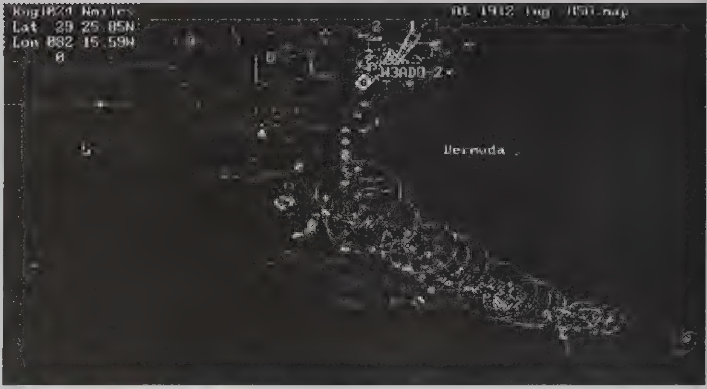


Figure 2. This plot shows how APRS displays the track of a moving storm. This is a partial replay of the Hurricane Bertha as it approached the South Carolina. The hurricane center is displayed along with the radius circles of Hurricane and Tropical Storm winds in red and yellow respectively. The small blue dots are the future 6, 12 and 24 hour estimates. Here, all TEXT has been turned off to avoid cluttering the screen. If you look closely, you can also see the WX station ICONS from several amateur stations on the islands and Florida.

Bob Bruninga - WB4APR - Bob wrote the DOS version of the APRS program. His email is **wb4apr@amsat.org**.

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Satellite Tales From the Ground Up

Terry Sellick WA9TTY

Destiny has conspired against me. If you'll remember from last time, I was just about ready to start construction of a 2m yagi for satellite work. A few weeks on the road for work and some other problems severely cut into my antenna design and building time. It turned into a race between me and myself as to whether this article or the antenna would be finished first. As I sit here typing this article, I'm also waiting for the first trial run of an actual contact with RS-10/11 with a mostly completed antenna.

Last time, I had just completed a 5 element yagi design using a T match with YO, a yagi antenna design program by Brian Beezley K6STI. I ended up going back to YO for a couple of reasons. The first reason was that I realized that my yagi input was inductive, and that the T match itself is also inductive. I shortened the driven element a little to make the yagi input capacitive, so that the T match inductive reactance would cancel the yagi input reactance. I then told YO not to modify the driven element, and then turned it loose optimizing the other elements and spacing. I ended up with about the same gain with the desired slightly capacitive input impedance. I was just getting ready to cut the elements when I received notice from Brian Beezley K6STI that the version of YO I had found on a CDROM was a pirated version, and was not accurate for VHF yagis. So I quickly ordered the latest version and waited for it to arrive. Brian was kind enough to rush out my order over the Internet. The new version, YO 6.5 had many improvements over the first version I had tried - YO 1.0. It was much faster optimizing, had faster graphics, better printing capabilities, mouse support, and many, many other features. You can grab an element with your mouse, reposition it on the boom, or change it's length. It has a handy trade offs triangle which allows you to quickly set optimization parameters among SWR, F/R gain and forward gain by grabbing a dot within the triangle with your mouse and moving it toward the triangle's vertices (SWR, F/R gain and forward gain). YO also lets you pick between several matching schemes - perfect, hairpin, gamma, and T. It will also handle arrays of yagis.

I started over again with the original design from the '78 handbook and let YO optimize the design. As before the original design was not bad, but was improved considerably by YO. One of the things that I did was to eliminate the large reverse lobe of the antenna gain pattern. When working satellites, the antenna is usually pointed up, and there is no need to receive signals from the rear of the beam. Again, I had to shorten the driven element to produce a capacitive input to work with a T match. I was able to select the T match and vary the rod diameter, length, spacing and other parameters, and instantly see their effect on antenna gain and SWR. Finally I arrived with a design which met all of my requirements. The result is shown in Figure 1. The numbers within the pattern are from top to bottom, frequency, forward gain, front to rear ration, input impedance, SWR, and gain FOM. The yagi number in the lower left corner indicates the number of designs considered. Although the number says yagi 36, I saved several designs in different files along the way. I actually went through several thousand designs in a short period of time, before arriving at this one. It all looked good on the CRT, but it was now time to build it and try it out.

Last time, I was trying to decide whether to go with two yagis at right angles on a cross boom or put the yagis on a concentric boom. I decided that I would try the concentric boom approach. It is less cumbersome, has less wind loading, but is a little more difficult to mount. Two yagis should give me about 3db more gain, as long as I can correctly match the polarization of the satellite. I still haven't figured out what two yagis will do to the beam pattern width. I guess I'll find that out experimentally. I decided to use 11/2 inch PVC pipe for the boom. At a 6 foot boom length, 11/2 inch PVC pipe is lightweight and fairly rigid. I probably could have gone down to 11/4 PVC pipe.

The first step was to cut the element lengths. I used 1/4 inch aluminum rod for the elements. Some words of advice - measure twice, cut once. It will save you another trip to the hardware store. Not that I had this problem you understand - well, at least not this time! I converted all of the dimensions of the elements and their positions from inches to millimeters. If I had input the starting dimensions into YO as millimeters, it would have output the dimensions in millimeters. I used a tape measure with both inches and millimeters to measure the element length. The theory was that using millimeters would allow for more accurate measurements and cuts. I then laid out the holes for the elements in the boom. I used a drill press to get one set of holes exactly vertical. I then rotated the boom 90 degrees, placed an element through one hole, used a level to make that set exactly horizontal, and then drilled the second set of holes. If you are more talented than I, drink less coffee, and have a steady hand, you could probably drill all the holes free hand. I centered the elements in the holes, and used silicon sealant to 'glue' the elements in position. I want to be able to take this apart when I move. When this antenna gets to it's final resting place, I will use hot melt glue or epoxy for a more permanent seal .

The next step was to add the T matches to the boom. With two yagis on a concentric boom, two T matches tend to get in the way of each other. I decided to place one T match behind one driven element, and the other T match in front of the other driven element. I used 1/8 inch brass rod for the T match rods, and aluminum strips for the shorting straps. One end of the brass rod was glued in a plastic spacer, and then glued to the SO-239 connector mounting plate. The other end is held by the shorting strap.

The polarization scheme and the 4:1 balun to reduce the 200 ohm yagi input impedance to 50 ohm required coax types that I had never heard of - RG-133 (95 ohm), RG-142U or RG-303U (50 ohm), and some standard RG-59 (75 ohm) coax. I also needed a coax relay for switching between left and right hand circular polarization. So began the Great Oddball Coax Hunt! RG-59 was easy. Everybody has RG-59! Ask for the others, and people say Huh?, and look at you very strangely. When you explain that you're a amateur radio operator and that you need this for a cross polarization switching, impedance reduction scheme so that you can listen to satellites, their eyes glaze over, and they politely show you the door. Don't try this at Radio Shack! Luckily there was a local hamfest coming up. There are always cable companies with lots of different cable and wire at hamfests. I was able to get the RG-142, but unable to find any RG-133. One salesman said that RG-62 was the same as RG-133, but he didn't have any of that either! I did manage to find some used, but nice coax relays. They were rather small, but I think that they will handle my current power level of 25 watts. If and when I add an amplifier, I'll have take another look at these relays.

When I returned from the hamfest, I checked a Belden cable catalog. RG-62 has the same impedance as RG-133, but has a different velocity factor. The velocity factor is used when you're calculating lengths of coax in wavelengths. A slightly longer piece of RG-62 should work in place of the RG-133. I tried some of local electronic distributors, and found one that did stock RG-62. I now had all of the parts required to complete the antenna.

The yagi was designed for a center frequency of 146 Mhz. I needed to cut 1/4 wavelengths of the RG-59 and RG-62 coax. From the ARRL Antenna Handbook:

1/4 wavelength (ft) = 245.9 x Velocity Factor / Frequency (Mhz)

The velocity factor for RG-59 foam coax is 79, and the velocity factor for RG-62 is 84. This meant 1/4 wavelength is 1.33 feet for RG-59 and 1.41 feet for RG-62. These pieces of coax and the coax relay were used for the polarization switching scheme. See Figure 2. This method came The Satellite Experimenter's Handbook. The balun for each yagi required 750 mm RG-142. The balun came from the ARRL Antenna Book.

I cut the coax to length and added connectors - lots of connectors. It's not possible to do this without connectors, but I'm afraid to calculate the loss of all those connectors. I mounted the baluns on the boom. As shown in the pictures, the baluns are the loops of cable behind and in front of the driven elements. I temporarily taped the T connectors to the boom. Ideally the T connectors and the coax relay should be mounted inside a water-proof box of some sort. My wife has this tupperware container which would be ideal for this purpose, but she refuses to part with it. I'll have to turn up the charm or break down and go out and buy my own.

Finally I had everything wired, except for the 12v to the coax relay. I mounted the antenna on a PVC cross boom and placed it atop a wooden ladder for testing. This allows easier tuning adjustments and avoids that wobbly knee problem which I'm sometimes prone to at heights just above rooftops. I need to beg, borrow, or buy a VHF SWR meter to check and optimize SWR. The one thing that concerns me about this design is the construction and adjustment of the T match. I haven't used T matches before and I will need to spend some time carefully adjusting this.

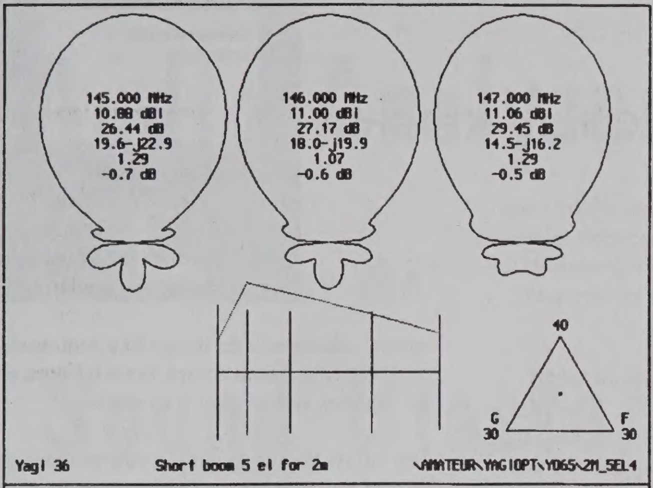
The first thing I tried was receiving with the antenna. I could receive signals fairly well off the front of the yagi, at least as well as with my Ringo. I tried a low power test with my Yaesu 225RD, and was able to key some local repeaters. Without 12v connected for switching the coax relay, I'm stuck in either left or right hand circular polarization. I haven't figured out which yet. There was a good RS-10/11 pass with a 65 degree maximum elevation (MEL) which was going to occur about an hour after I completed the antenna. I couldn't resist the temptation to try it out. I adjusted the ladder so that the antenna pointed in the correct direction for the MEL, placed a wooden support under the tail end of the boom to provide the correct MEL, and waited. As the RS-10/11 pass occurred, it started out below the horizon about 80 degrees North of the direction that my antenna was pointed. It wasn't about until the elevation was about 25-30 degrees above the horizon that I located my downlink CW signal. I switched to USB and was able to hear it for the first time on the downlink! I called CQ, but got no response. Shortly after RS-10/11 reached MEL and started moving away from me, I could no longer hear my downlink signal. This could be for a couple of reasons. The first and most probable is that I had the correct polarization for the approach, but could not switch to the opposite polarization for the satellites recession. Another possibility is that the antenna beam width was more centered on the approach. This definitely requires more tweaking and testing, but could be considered a limited success.

The next few items on my to-do list are to run a 12v line to the relay, check SWR and adjust the T match. I also need to experiment with aiming the antenna to determine how well it works, and how much of the pass it will cover without a rotor. This should give me an approximate idea of the beam width. A small TV rotor will easily rotate the antenna. I'll try to scrounge up one. Then I'll be able to experiment on the effects of rotation with a fixed elevation angle. I'll let you know what happens.

In the over the horizon news department, the Russians have launched RS-16 , a Mode A (2m up, 10m down) bird. It is attached to another satellite and travels under the alias ZEYA (24744U) in the Keplerian elements. Its' uplink is 145.915 - 145.948, downlink is 29.415 - 29.448, and has beacons at 29.408, 29.451, 435.504, and 435.548. Several hams have reported hearing various beacons at different times, but the transponders are not operating yet. Check www.amsat.org for the latest details. I have added this bird to my tracking group but have not heard it yet. The next shuttle flight STS-83 was scheduled for launch on April 3. Voice frequencies are 144.91, 144.93, 144.95, 144.97, and 144.99 up and 145.55 down. It also has many SAREX contacts scheduled which the astronauts are looking forward to. The flight duration is 15 days. If it launches on time, it may have returned by the time you read this, but if it's delayed, you may still stand a chance for a contact. Check **www.nasa.gov** for more info.

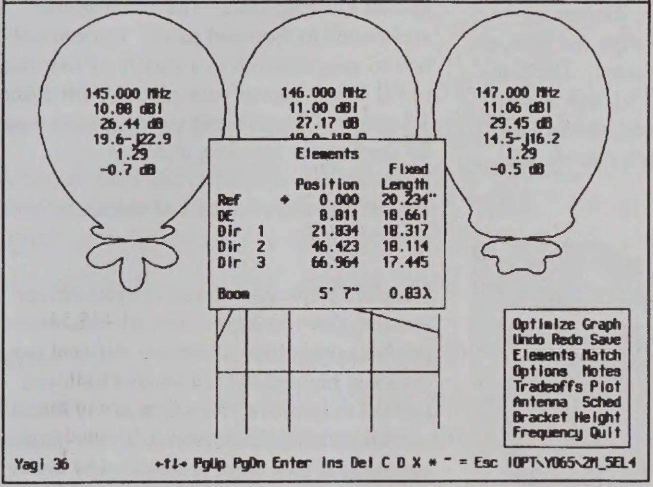
Next issue I'll be looking into tracking programs for DOS/Windows. I will pick one of the many and giving a detailed report on it. I'll also report on the continuing antenna saga. Hopefully, the RS-16 transponders will be turned on and I'll have a new bird to try out. Maybe you and can talk through it. 73 and see you next orbit.

Terry Sellick - WA9TTY - Terry has been a ham for 30 years. He's not really that old, just got started early! Degree in Electrical Engineering, but have been slumming for the past 10 years. Currently working as a mild-mannered Sr Software Engineer for a major metropolitan machine tool company. Writer of real-time software for machine tools, data acquisition systems and embedded systems. Programming languages: C, Pascal, Basic, and assembly (sigh). OS experience: DOS/Windows, Unix, Linux, OS/2, AmigaDos, and VMS. His email address is **tsellick@bix.com**.



```
145.000 MHz     146.000 MHz     147.000 MHz
10.88 dBI       11.00 dBI       11.06 dBI
26.44 dB        27.17 dB        29.45 dB
19.6-j22.9      18.0-j19.9      14.5-j16.2
1.29            1.07            1.29
-0.7 dB         -0.6 dB         -0.5 dB

                                      40
                                  G        F
                                  30       30
Yagi 36        Short boom 5 el for 2m        \AMATEUR\YAGIOPT\YO65\2M_5EL4
```

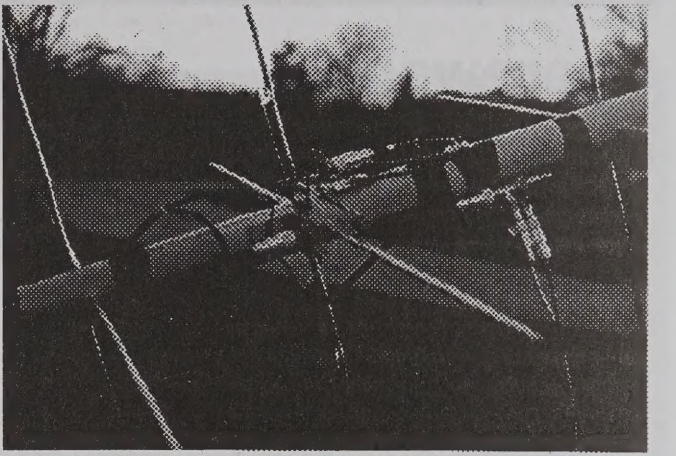


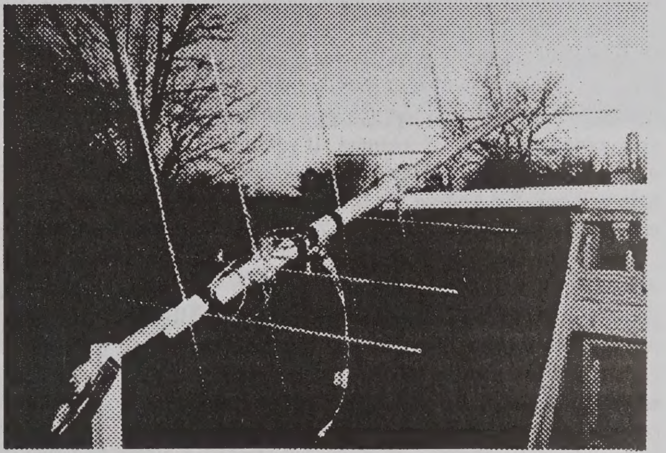
```
145.000 MHz     146.000 MHz     147.000 MHz
10.88 dBI       11.00 dBI       11.06 dBI
26.44 dB        27.17 dB        29.45 dB
19.6-j22.9                      14.5-j16.2
1.29                            1.29
-0.7 dB                         -0.5 dB

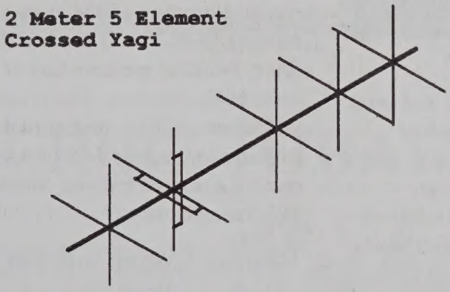
            Elements
                              Fixed
                   Position   Length
Ref      ♦          0.000     20.234"
DE                  8.811     18.661
Dir  1             21.834     18.317
Dir  2             46.423     18.114
Dir  3             66.964     17.445

Boom               5' 7"      0.83λ
```

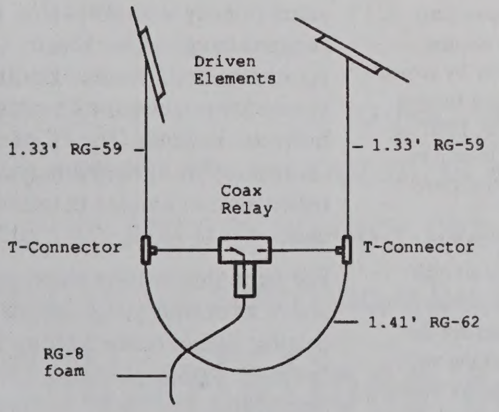
```
Yagi 36   ←↑↓→ PgUp PgDn Enter Ins Del C D X * ˜ = Esc IOPT\YO65\2M_5EL4
```







2 Meter 5 Element Crossed Yagi



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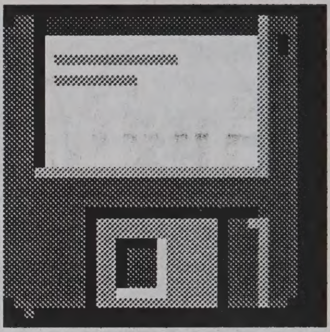
Shareware Reviews



Ronnie Cohen - KF4GHG

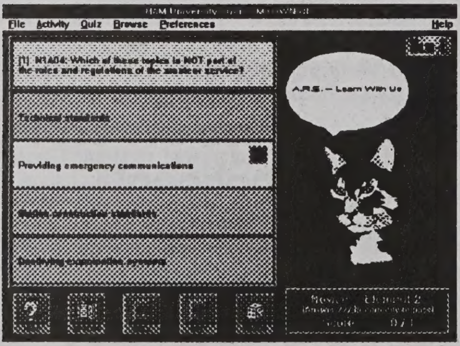
HAM UNIVERSITY

My Friends laughed when I told them that Ham-U was helping me get my FCC license upgrade. But after a while they wanted to know how they could get "Professor" Morse the Cat's assistance.

Ham-U is a Windows(tm) amateur radio teaching tool for license upgrades. The curriculum covers Novice through Amateur Extra license grades, including Morse code. The program comes with 16 or 256 color nodes and an easy to use menu system that will get you going in a matter of minutes. If you do encounter a problem, the on-line hypertext help will assist in finding the solution so you can continue learning.

After Ham-U is installed on your hard drive you can configure the program to your own needs. You select the desired license quiz, type of feedback, and help options. Quizzes are administered in FCC exam sequence or in random order. Responses are rewarded with praises or applauds for correct answers or corrected answers for incorrect responses. To help practice, Ham-U can focus on your problem areas, specific exam categories, or incorrect responses.

Ham-U's systematic approach to teaching Morse Code is ideal for beginners or experienced hams. You start learning code from your own customized lesson plan. On the first lesson for each letter, Ham-U sounds the code and displays the letter and your response. If you pass this first lesson you advance to greater speeds and combination of letters you have learned in previous lessons. Otherwise, you continue practicing by redoing previous lessons.



[1] N1A04: Which of these topics is NOT part of the rules and regulations of the amateur service?

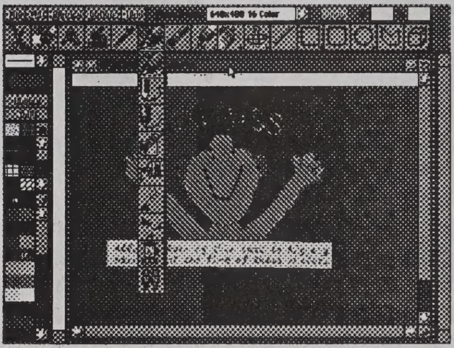
Technical standards

Providing emergency communications

Station construction standards

If you think you are ready to take your license exam, Ham-U generates practice exams to help you. The program corrects your exam and shows the correct and incorrect responses. You can study the exam by reviewing all the questions or only the correct or incorrect answers.

Ham-U requires a system with an 80286 processor, hard drive, DOS 5.0, 16 or 286 graphics and Windows(tm) 3.1. A sound card is recommended, but the program will work fine with your PC's speakers. Demos of Ham-U can be down loaded from the Web, or obtained from Shareware vendors. The commercial program costs only $30, and is well worth the investment. To purchase the Ham-U contact: MICA, 2845 140th Avenue NE, Bellevue, WA 98005.



NEOPAINT

Neopaint is a powerful image editor and paint program. It is extremely easy to use and includes features that you will expect to find only on expensive commercial software. After trying Neopaint for a week I registered the program. As you will see it is well worth the investment.

Neopaint's graphical user's interface, gives you the touch and feel of a Windows (tm) application. Program options are mouse selectable from a menu, hot keys or by icons. After you have configured Neopaint to your system, you can import PCX, TIFF, BMP or GIF graphics. Or you can create your own pictures and save them in one of the afore mentioned formats.

Creating/editing an image is really simple. On the top line of the opening screen are drop down menu options. These options are for file manipulation, editing and working with images. You can take an image invert the colors, rotate the graphics, scale the image, adjust the contrast or add special effects. These five special effects will do things like acid wash your creation, blend colors, draw borders, create cameos, and change your canvas.

Just below the top menu is a row of icons with special drawing tools. The brush option allows you to freehand paint. You can add text to your creation in a variety of font sizes, or fill in any part of your picture with different colors. The airbrush option creates a subtle shading for blending different colors. There are also options to add lines, boxes, circles, polygons and even 3-D objects to your graphics.

Neopaint's specialty graphics tools include features that you expect only on high-priced graphics programs. There are charcoal pencil drawing, highlighter, crayon and quill pen options to improve you graphics. Watercolor and oil painting features makes your graphics appear as if they were professionally drawn.

One of Neopaint's best features is that it will run on almost any IBM compatible system running DOS 3.1. It needs a mouse, hard drive, 640K of memory and at least a Hercules compatible monitor. The program comes with a database of 300+ printer definitions. Registration is only $45. Registered users receive a printed manual, technical support and free updates.

Ronnie Cohen - KF4GHG - Ronnie is a Professional Engineer and has been involved with computers for over 12 years (mostly with software). He enjoys programming in Quickbasic, C, Assembly, and Paradox. He has written shareware reviews for The Alternative Software Bulletin, The PC Monitor, Computers in Agriculture, and has published several articles in technical journals.

For more information about any of the above shareware programs, or a free disk catalog, please contact Mom 'N' Pop's Software <ASP>, PO Box 15003-HD, Spring Hill, FL. 34609, (352) 688-9108.

Audio Analyzer

for the

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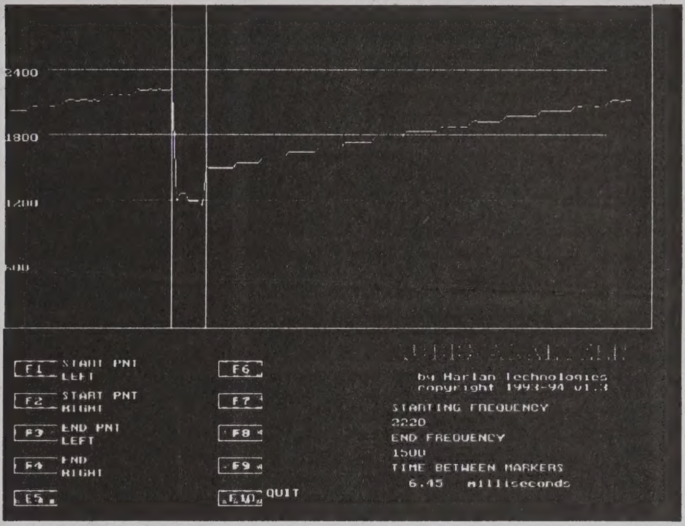

```
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TIME BETWEEN MARKERS
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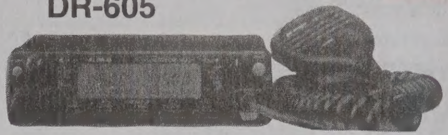
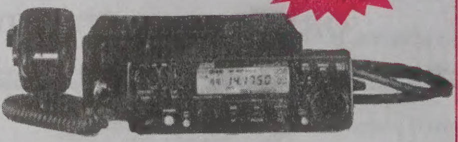
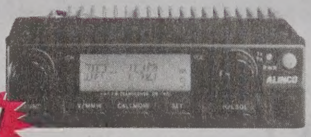


2M/440 MHz Mobile

100W on 6M



DX-70TH
HF +6 Meter
Mobile/Base



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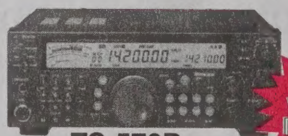
TM-V7



TS-570D

Also with 6 Meters

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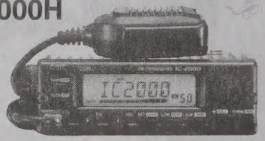
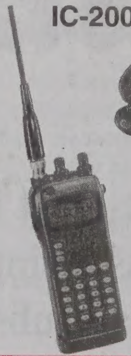
IC-2000H



Wide Band Receive
2M Mobile



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